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GAS JOURNAL

LIGHT • HEAT • POWER • BYE-PRODUCTS

[Founded in 1849 as the "Journal of Gas Lighting."]

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1924

Features of the Year.

As this issue of the "JOURNAL" is passing through the post to our subscribers, the Old Year will have closed and the New Year will have opened. The one now ending has been peculiar in various ways. It has been a year in which Old Sol has been very reluctant to add to our pleasures, in which there have been unprecedented political experiences, and in which we have had the British Empire Exhibition at Wembley—vast, comprehensive of the Empire's industrial power and trading resources, and manifesting our great progress in the production and improvement of those things which are for the convenience and service of mankind. The small exemplification of summer weather that we have experienced has unquestionably added to the business of the gas industry; but those identified with the industry, while thankful for some bright ray in the absence of those from the sun, would have been better pleased to have shared with their fellows in a summer more in accord with those which have given joy in the past. Politically, the year brought us to the climax of instability. Our Parliaments have had short lives in recent years; in this one His Majesty the King has visited Westminster twice to address a new Parliament—in January and in December. The disastrous election of December, 1923, gave to the country no party with a mandate and power that could be of any real service to the nation. The composition of the House had fallen to pieces, and everyone knew that the time was not far distant when there would have to be another appeal to the electorate. A Conservative Government took office in January with Mr. Baldwin as Prime Minister; but though, of the three chief parties, the Conservatives were present in the House in greatest number, it was well known that they could not continue in office if the Labour-Socialists and the Liberals combined to dislodge them. It was soon apparent that this would occur, and that, by the aid of Mr. Asquith and his followers, Mr. Ramsay MacDonald would be called upon to form a Government from the Labour-Socialist members, who in number exceeded the Liberal Party.

This happened; and thus the country had for the first time in its history a Labour-Socialist Government. There were indications that the Government intended at the outset to show a fair moderation in the policy they pursued; and when the Budget was presented by the Chancellor of the Exchequer (Mr. Snowden), there was a chorus of approval, with the one exception that it was clear that no provision had been made in the estimates for the large schemes of social "improvement" which were in contemplation. For some months Mr. MacDonald held the reins of office; but the Government had not proceeded a great way in the management of the nation's affairs, before it became clear that they were being governed by the extremists. The entanglements became too great and serious. In the autumn there was considerable outcry regarding the Russian Treaty, as well as over the withdrawal of a prosecution against the Editor of a Communist paper for the publication of a seditious article. Respecting this matter there was a great deal of excitement in the House; and the Government elected to appeal to the country if defeated on a resolution regarding it. Their fall came promptly; and there was a rushed General Election in November. In the result, once again Mr. Baldwin stood at the Bar of the House of Lords as Prime Minister (with the knowledge that he had a considerable majority over other parties in the Commons) to hear the speech which declared the policy of his new Cabinet. A very strong Government have been put into power; and the hope of the whole country is that now there will be a continuation of stable and peaceful government, in order that the country may work in greater security for the rehabilitation of its fortunes, which were so sadly depreciated by the war and subsequent events, including great unrest in industry.

THE BRITISH EMPIRE DEMONSTRATION.

Turning to the events which have exercised an influence upon the fortunes of the gas industry during the year, it is only intended to mention the chief features, as, owing to the vast area of the industry's work and the influences bearing upon it, it is impossible to review fully a year's doings within reasonable compass. On this occasion, capital position should be given to the magnificent British Empire Exhibition, which was held at Wembley. It was opened by the King on April 23; its gates were closed on Nov. 1. That Exhibition was a grand conception, and a triumph of constructive and organizing ability. It brought before the world the vast power of British industrial and trading capacity, as well as the enormous extent of the resources of the British Empire in the matter of raw materials. From all parts of the world there came visitors to the Exhibition, who went away gratified with, and impressed by, the wonderful display in the mammoth ferro-concrete buildings devoted to engineering, industry, and the products of, and life in, our Dominions beyond the seas. Altogether some 17½ million people paid a visit to this imperial enterprise, the mission of which it is acknowledged on all hands was completely and successfully fulfilled.

THE GAS EXHIBIT.

In the Palace of Industry, the gas industry very properly had an Exhibit which possessed many striking features. One of these not appreciated by the ordinary visitor, but known within the industry, was the large enthusiasm that it represented of those responsible for the conduct of British gas undertakings not only at home, but some across the seas. There were many which did not subscribe; but it may be said that most undertakings of any importance and position, with progressive administrations and officials, were in the list of contributors to the funds. Not only they, but the manufacturers of gas plant and gas appliances, did their good part. The members of the Society of British Gas Industries contributed towards the total found by the industry—between £70,000 and £80,000—a sum of £11,000, and in addition supplied the apparatus and appliances necessary for the equipment of the buildings. It would be almost invidious to mention individuals who took large part in fostering this display, but we cannot refrain from mentioning the strong support given to it by the President of the National Gas Council (Mr. D. Milne Watson), the President of the Gas Companies' Protection Association (Dr. Charles Carpenter), the (now ex-) President of the Institution of Gas Engineers (Mr. Samuel Tagg), the then President of the "B.C.G.A." (Mr. H. Wade Deacon), the then Chairman of the Society of British Gas Industries (Mr. F. C. Tilley), and his successor (Mr. H. Wilfrid Drake). The members of the Executive Committee, to whom the gas industry confided the organizing of the Exhibit, were presided over by Mr. F. W. Goodenough; and it is only right that it should be placed on record that he did the largest amount of "collar work" which resulted in an Exhibit which was acclaimed

throughout the industry and by experts to be the gem of the Palace of Industry. All the members of the staff of the British Commercial Gas Association were great enthusiasts; and to them large credit is due for the mass of advertising work and the organizing of the several functions associated with visits by various professional organizations to the Exhibit.

The buildings in which the Exhibit was housed were gracefully designed. The scheme of presentment of the work of the industry was of an order which showed great artistic merit, effective demonstration, and claimed in whole or in part the attention of, and impressed, every individual who visited it. One of its chief features which will long be remembered was the series of small rooms, beautifully furnished and gas equipped, and attended by living representatives of the "Seven Ages of Woman." In every part, whether on the domestic side, the industrial side, or the trading side, utility was combined with refinement, and the vast service that gas can render to mankind was typically and thoroughly illustrated. The bye-products of gas manufacture were also on view, as well as historical exhibits. The Exhibit has sent its messages far and wide; and the good work done will live, and its effects will long be felt.

Not to be forgotten, too, was the splendid example of outdoor lighting by the "Wembley" low-pressure lamps in the Amusements Park. This was carried out by Messrs. H. Staniforth & Co. A large amount of gas was also consumed by exhibitors in various other parts of the Exhibition; but particularly the eminent caterers (Messrs. Lyons & Co.), whose estimated requirements for the task of feeding the multitude were something between 70,000 c.ft. and 80,000 c.ft. per hour when work was at full swing. Upon the Engineer and Manager of the Brentford Gas Company (Mr. A. A. Johnstone) and the Deputy Chief Inspector of the Company (Mr. G. L. Jennings) fell the work of providing for the conveyance of gas to, and its distribution at, the Exhibition. This was owing to the site being in the area of the then Harrow Gas Company, which has been absorbed by the Brentford Company.

As already indicated, during the course of the Exhibition, many professional organizations visited it; and a large amount of attention was paid to the Gas Exhibit. On all hands, it was described as a splendid piece of co-operative effort and enterprise; and there is no question that the verdict of those outside the industry completely confirmed that of the men of the industry itself. Representatives of the industry paid several visits to it—particularly the members of the Institution of Gas Engineers, the "B.C.G.A.," and the Society of British Gas Industries, as well as the members of Salesmen's Circles on the occasion of their notable Joint Meeting. Many of those attending the World Power Conference—visitors from all parts of the globe—made inspection; and so did the delegates to the International Advertising Convention—especially those from the United States. At all times, the same opinion as to excellence was expressed. When so many men from different countries, viewing the same object from their own standpoint, are in accord, the common opinion must be the correct one. Any contradiction of the verdict would have but a hollow sound.

Coal Conservation and Co-ordination of Fuel Use.

The Part of the Gas Industry.

The inception of something which we believe will have a most important effect upon the future of the gas industry—if properly handled and prosecuted—has taken place during the year. We believe that already movement has begun in the central quarters of the industry which will follow up this matter. As to the manner and fashion of this movement time will show. Just recently Mr. Reginald Clarry, in the House of Commons, in a speech on the Address from the Throne, referred to the question of the need, in the national economy, for a wide inquiry into the subject of coal conservation and the co-ordination of the use of fuel. He also alluded to the part that the gas industry has already taken in this. What it has done can be vastly extended. Ever since the Committees who sat during the war—Committees electrically controlled—to consider the question of power, and reported upon what should be done by the electricity industry, Sir Arthur Duckham has taken every opportunity of urging that the conservation of coal and the co-ordination of the use of fuel should be made the ground of common inquiry, and comprehensive of all uses. That is the only way to preserve our resources and to bring to the credit of our national account the economies that can be realized.

The First World Power Conference gave an opportunity which was not neglected by the gas industry. Numerous papers were read in the various sections treating of what was being done in different parts of the world in the utilization of fuel and water power. As we have comparatively negligible water power in this country, it can here be dismissed from consideration. Our native and basic source of power is coal; oil is an importation, subject to market fluctuations, and having comparatively little bearing in this country on the wide subject of the co-ordination of fuel use. Out of all the sections at the Power Conference, the one which could show the most economical use of coal, and which revealed large scope for co-ordination of the use of fuel, was the Gas Section. In no other could it be shown that coal was being used with similar over-all efficiency; and perhaps the least efficient use from the thermal point of view of which one heard at the conference was that of electricity generation. This being so, it is the business of the country to ascertain whether by some means—electricity being an essential of the age—something cannot be done to secure its generation on more economical lines than by the burning of raw coal—lines which will contribute to co-ordination of fuel utilization.

During the year more has been done in districts where hitherto there has been no electricity supply in combining it with existing gas-works. In this matter, Mr. A. Hugh Seabrook—an Electrical Engineer of broad views as to the national need for coal economy—has taken a large part. The farther he has gone into the matter, the more convinced is he that gas-works are destined to play a large part in future in furnishing—perhaps not as distributors, but as producers—a good proportion of the electricity required by the country. He has suggested that they should generate and deliver into the main transmission cables. Upon that matters are advancing; and investigation is talked of as to the utilization of the waste heat from carbonizing and water-gas plants on gas-works for steam generation for the bulk production of electricity, also with the view of selling it to the distributors. Combined with all this is the largely increasing use of coke and breeze at electricity stations on the "Sandwich" system—the new Barton power station of the Manchester Corporation being the latest important example. Electrical engineers find that low-grade coal can be employed with coke on the "Sandwich" system with great monetary advantage and no sacrifice of boiler efficiency. It is interesting to note that Mr. E. W. L. Nicol, the Fuel Expert of the London Coke Sales Committee, calculates that the coke produced by gas-works is sufficient for the generation of all the electricity at present used in this country. In these several ways, we are advancing, and it may be truly said that the gas industry stands at the very front for effectiveness in this campaign for coal conservation and co-ordination of fuel use. That position must not be lost. It is highly important, and nothing must be left undone by the industry that can be done to make progress in this highly important national and industrial question. In his Presidential Address to the Society of British Gas Industries, Lord Weir stated that waste of fuel and energy was proceeding in this country on a gigantic scale. The gas industry, we believe, is destined to do much in helping to abate that waste.

Board of Fuel Research.

In any development of this inquiry, naturally the Board of Fuel Research would take a considerable part. We cannot mention the Board without alluding to the great loss the scientific world—especially the exploration of economic fuel utilization—has sustained by the death of Sir George Beilby, first Director of Fuel Research. Our columns during the year contained an eloquent appreciation by Dr. C. H. Lander, the present Director, of his former chief's charming personality, scientific attainments, and wisdom. The work of the Board (well founded by Sir George) is directed to ascertaining in divers directions the lines of economy and efficiency in fuel use, and therefore co-ordination. We should like to make this point, that to secure the greatest over-all economy and efficiency from co-ordination of fuel utilization, it may be necessary here and there to make some sacrifice in both; but this the end would justify. The point is in the mind of the Director. In one of his several

contributions to the subject of the carbonization and utilization of coal during the year, he mentioned that the work of the Board is not confined to thermal efficiency. Thermal efficiency may be purchased at too great a price; and there is economic efficiency which is of national, industrial, and domestic importance. For example, a high thermal efficiency may be purchased by the use of a high-class coal; a greater economic efficiency may be realized by the blending of a high-class and inferior coal.

LOW-TEMPERATURE CARBONIZATION.

So far, the question of the co-ordination of fuel utilization has not received much attention by the Board. There is no doubt they have it prominently in view; but up to the present their researches have been directed to definite processes and the best means of developing their efficiency and product. This work is no doubt a necessary precedent to dealing with the larger question of co-ordination. During the year, the Board have been devoting a large amount of attention to low-temperature carbonization, and have offered to test plants on certain conditions. They have tested the Barnsley plant, and made a report on it. The results have recently been noted in our columns, together with an incident (for which the Board of Fuel Research were not in any way responsible) in connection with the report, against which incident we protested in the name of high-temperature carbonization. Hyperbolical claims are a congenital disease with the low-temperature system. But this is not to say that low-temperature carbonization *per se* is a pariah of the carbonizing processes. It may, with developments, have its place in our system of dealing with coal—through, for instance, such a plant as that with which the name of Mr. Harald Nielsen is identified, and to which he referred in the course of an illuminating paper at the Manchester Smoke Abatement Conference. No opportunity has been lost during the year to advance consideration of the claims of low-temperature carbonization. Of it much was heard at the World Power Conference, and from many other platforms. Laudatory newspaper correspondence has been plentiful; the adoption by a Colliery Company near Nottingham of a plant has been made to vision that city as destined shortly to become smokeless. Mr. E. V. Evans, in his Cantor Lectures, showed that low-temperature carbonization, if studied from the thermal point of view, is out of the field; and Lord Gainford, in a letter to "The Times," uttered a much-needed warning to the public not to accept all that is heralded as to its virtues. The years pass; and not even as we approach 1925 has the system been proved commercially.

SMOKE ABATEMENT—GAS AND COKE.

The smoke abatement campaign has reached a higher and more satisfactory level this year; and despite all that is done to keep low-temperature coke prominent, the gas industry's part in the work is maintained as the providers of the most practical labour-saving heating agent, while from the solid fuel point of view its coke, even for domestic purposes, is not spoken of in the same disparaging terms as of yore. Grading and marketing of coke in convenient size for domestic purposes have had a wonderful effect. Good testimony has come from Prof. Boys and others as to its great value and excellent combustibility for domestic heating. Interest has also been aroused in the prospects of producing a still better coke by high-temperature carbonization processes by suitable blending of coals, or of coals and coke, for retort charges. By such means a coke is produced of better physical structure for combustion in open fires, and without loss of the valuable volatile matter of the coal. Blending for this purpose was referred to by Mr. Evans in the Cantor Lectures, and on different occasions by other experimenters. In the same direction much work has been done by the Board of Fuel Research. With such developments the main plank in the platform of low-temperature carbonization advocates would be removed.

Generally speaking, the position of the gas industry in relation to smoke abatement has been materially advanced during the year. The industry has had its pinpricks from those who are enthusiastic but impracticable on the subject of carbon monoxide. The real test of efficiency and satisfactory performance in use is provided by public favour; and despite the strenuous efforts of electricity purveyors, low-temperature advocates, and coal merchants, the records of demand for gas-heating appliances have been exceeded during the year. The excellent state of affairs in this regard has been disclosed by reports from many gas undertakings, and by what transpired at the Manchester Smoke Abatement Conference. The trouble is not to obtain custom for gas heating, but to get qualified men to meet the demand for fixing appliances. The "B.C.G.A." has been closely following-up and sharing effectively in the movement now in full swing. No opportunity is lost in that direction; and we have good allies without any direct interest other than that which proceeds from a desire to serve the public good from a health point of view. Lord Newton, now the leading political protagonist of smoke abatement, has been elected President of the Smoke Abatement Society. Through his instrumentality, when the Smoke Abatement Bill, which is now a hardy perennial, came before Parliament this year, the insertion was secured of a clause giving local authorities power to make bye-laws to bring about in new dwelling-houses the abatement of smoke from domestic fires and cooking appliances. Through the dissolution of Parliament, the Bill has not advanced; but the present Government have announced their intention of introducing a new one, though they cannot promise it for 1925. However, with Lord Newton at their elbows, there will be little prolonged rest from consideration of this subject, which affects substantially the health, lives, and pockets of the community. Such a matter is as important as any in the programme of domestic legislation.

GASIFICATION AND CARBONIZATION—THE COKE FACTOR.

In connection with gas production, there has been greater study during the year of the net cost of the production of therms in relation to the maximum therm yield per ton of coal. One result of this is that less is being heard of the complete gasification of coal. There is a reduced adoption of plants for that purpose; and this will continue while there is an absorbing demand for coke at good prices. This looks very much like continuing so long as coal cannot be produced at a cheaper rate, and there is small chance of that with coal miners' wages (excluding the other costs) at a height per ton of disposable coal exceeding the price paid for gas-making coals before the war. Moreover, through steaming charges in vertical retorts, the making of water gas, the demand for coke for power stations and industrial purposes, the greater export trade in it than before the war, the gas industry has it within its power to better regulate the supply of coke to the demand. In other words, it has more strings to its bow in this respect than was the case at one time. Another result of this is that water-gas production is not, having regard to the net price per therm into the holder, so profitable as coal gas production. Of course, there are other considerations which make water gas indispensable to many gas-works. To it some credit is due for the position of coke in the markets; and its services for dilution purposes (especially with horizontal working) and for peak loads and emergencies maintain its importance in gas-works equipment. A considerable amount of attention has been devoted during the year to the development and balancing of coal-carbonizing conditions with a view to realizing maximum results, and attention has also been directed to the fact that thermally and monetarily in horizontal retort working combustion chamber temperatures of about 1200° C. are preferable to higher ones—say, 1400° C. In all respects the physical laws governing carbonization are being more widely studied.

As previously indicated, Mr. Evans dealt in the Cantor Lectures with carbonization from the thermal point of view. He also treated of the close relationship that exists in carbonization between the production of gas and tar—holding that much of the work formerly published has been misleading because investigators have failed to appreciate the thermal relationship between the three products derived from the carbonization of coal. If greater consideration were given to their respective thermal values relatively to that of the coal used, much greater light would be thrown upon the efficiency of the process as operated in different gas-works and under different systems. Dealing with the improvement of carbonization efficiency, Mr. Evans drew attention to the fascinating subject of the transmission of heat through the charges, and with the effects of mixing a proportion of coke with the coal charge. This facilitates the conduction of heat through the mass, and produces greater uniformity of heating. When using a 75-25 coal-

coke mixture briquetted, the process is accelerated to such an extent that the gas is expelled from the coal in six-and-a-half hours, instead of nine-and-a-half. Thus throughput is not injured by the gas-producing material being reduced by 25 p.ct., seeing that time is diminished by 31·5 p.ct. It is easy to picture other advantages—such as lower combustion chamber temperatures and wear and tear on the retorts. From the blending, a denser coke of greater combustibility is also obtained.

The battle continues between continuous vertical retort working (with charge steaming) and horizontal retorts with water-gas production. But the former pursues its progressive way into adoption. At the same time the system is not having a complete walk-over, in view of the fact that there are gas-works using horizontal and water gas plants which are selling gas at a lower price per therm than works with the vertical system with steaming. There are, however, so many factors affecting the price at which gas is sold that comparison on the price-charged basis is not a reliable one for judging the relative economic effects of carbonizing systems.

A point bearing upon the co-ordination of fuel utilization can be made by reference to the progress that is being effected in the utilization of coke-oven gas by gas undertakings for general supply. There is an enlarging business in this direction. The Board of Trade returns issued this year show that 4268 million c.ft. of coke-oven gas was supplied in 1923 to statutory gas undertakings, as compared with 3636 million c.ft. in 1922.

On the Works.

Besides carbonization, the technical proceedings of the year have dealt with most of the other processes of a gas-works; but it is impossible adequately to deal with them in a sketch of this nature. A considerable amount of extension work has been carried out, and descriptive articles have been published. Waste-heat boilers have entered into larger service; so has the use in retort-houses of coke transporters, with inclined quenching benches. The mechanical removal of coke from ash breeze likewise makes headway. We are expecting soon to hear of the advent of tankless holders in this country. They have had a fairly considerable adoption on the Continent, and in the United States contracts have been entered into for some large sized ones.

Coal.

At the beginning of the year, it was known that certain gas undertakings had succeeded in entering into contracts for coal from June at lower prices. The willingness of coal owners and factors to make forward contracts was due to the prospect that the changed conditions in the Ruhr coal-field would re-act prejudicially upon British coal exports; and looking across the Atlantic, the growth of the export trade from the States was noted. As a matter of fact, German coal is now being exported in considerable quantities to Sweden, Switzerland, and Austria. All markets accessible by the Rhine and adjoining waterways—more especially Holland—are receiving supplies from Germany. One authority believes that, with costs what they are in this country, compared with the costs and the hours of working in Germany, coal from that country will be able to compete in our coast towns with British production. Small wonder that the British owners and miners are viewing the position with dismay; and yet the latter are not prepared to contribute to the reduction of production costs by returning to an eight-hour day. Although the West Yorkshire Coal Owners' Association were incensed with the owners and factors who had so early entered into contracts, events proved that they had done the right thing, for the year saw a heavy fall in the export coal trade. Glad enough are the owners now to have the home trade that is going—particularly the steady demand of the gas undertakings—in view of the continued industrial depression in the country. As a matter of fact, the quotations for the best classes of gas-making coal at the end of the year show a decline of about 2s. 6d. per ton upon the prices obtainable at the beginning, and second qualities have receded more than that. Those who protested twelve months ago against contracts being entered into at lower prices are silent to-day.

But it is difficult to forecast the probable trend of coal prices. One would imagine that they cannot go lower, having in view the costs of production per ton of disposable coal, in which miners' wages, of course, have leading part. Events have not tended to lower the costs. At the beginning of the year, a ballot was taken as to giving three months' notice to terminate the national agreement; and there were visions of trouble ahead for consumers. The men were advised by their leaders to vote in favour of termination. Notice was given, and this was to expire on April 17. The Labour-Socialist Government, however, did not regard disturbance in the mining industry as being desirable in view of other troubled waters which they knew were inevitably ahead for them. The Minister of Labour appointed a Committee, which was presided over by Lord Buckmaster, to ascertain the facts relating to the dispute. The Court of Inquiry cleared the ground, and gave the parties an opportunity of resuming negotiations, with a view to the modification of the terms of the agreement of 1921. As a result a new agreement was arrived at, and temporarily difficulty was avoided. But there have been hints that, in 1925, a further revision will be sought, although the situation is such that, if costs are further increased, the British coal-mining industry must go from bad to worse. But the Miners' Federation are alarmed over the position of the export business and the effects of reparation coal. They want, however, to pull the ropes so that hours shall not be affected. There has been an effort to get the hours and wages of British miners standardized internationally; but German miners cannot do as their British mentors would have them. Nationalization of the mines has also been the cry during the year—by the Miners' Federation and their allies, but not by the nation. The House of Commons rejected a Bill to provide for the nationalization of mines and minerals. Now the Coal Mining Association have invited the Federation to meet them to discuss the position of the industry, and the steps to be taken to remove from it the depression which exists. The Miners' Federation have expressed their willingness to meet the owners to hear their proposals; and so of this more will be heard shortly.

At the moment, therefore, there is not a single ray of hope of costs of production being reduced—costs which have increased since the new agreement came into force. Light on this is found by comparing the first two quarters of the year. In the March quarter, 67,047,657 tons of coal were raised. Deducting mine consumption and miners' coal, there were available for disposal 61,201,718 tons of coal. In the June quarter (two months of which were under the new agreement), 61,552,868 tons of coal were raised; making the deductions mentioned, there were 56,299,463 tons for disposal. In the March quarter, the net cost per ton of disposable coal was 17s. 10·26d., of which wages represented 12s. 7·3d. In the June quarter, the net costs per ton of disposable coal were 19s. 3·43d., of which wages represented 13s. 8d. This difference in the single item of wages does not inspire much hope. Unfortunately, too, the output per man-shift in the second quarter showed a decrease from 17·79 cwt. to 17·48 cwt. From all appearances, one would have to be of a super-optimistic disposition to anticipate any substantial reduction in the price of coal.

Regarding the serious decline in the exports of coal, for the eleven months ending November, the shipments, according to the Board of Trade returns, totalled to 56,483,748 tons, compared with 73,575,713 tons in 1923; the values being respectively £66,507,781 and £92,659,201.

At the World Power Conference and on several other occasions at technical meetings, there was continued complaint as to unclean coal, and the uneconomy and inefficiency for which it was responsible. The Secretary of Mines in the late Government (Mr. E. Shinwell) was proposing to make the question of incombustibles in household coal a matter for inquiry, as he did (without much effect) the price of coal to the domestic consumer. A suggestion has been made in the London County Council that the impurity of coal should be made a matter for legislation; but no conclusion has yet been reached on the matter.

Gas Coke.

The demand for gas coke has continued good during the year. The improved position compared with former days was the subject of comment by the President of the Institution of Gas Engineers (Mr. Samuel Tagg) in his Presidential Address. He indicated as effects contributing to this the use of coke for steam-raising and other industrial purposes, exports, and the reduction of the amount available by its use in water-gas plants and the steaming of charges

in vertical retorts. These contributory influences have already been noted in this review, as well as, in cultivating and maintaining demand, the work of the London Coke Sales Committee, through their expert Mr. E. W. L. Nicol—work that is never ceasing, and always of advantage in increasing demand. But the gas industry must not expect to be free from competition in the matter of coke. The eyes of the low-temperature people are upon the domestic market; and at collieries more consideration is being given to the use of low-grade material from the mines, and the production of a coke suitable for domestic purposes. Therefore ash, moisture, physical structure, and size of gas coke are matters which must be studied, and as far as possible improvements be effected. The position of gas coke exports is interesting. In the past eleven months, less has been shipped than in the corresponding period of 1923, but rather more than in 1922. The figures (for the eleven months) are: 1924, 884,552 tons (value £1,547,058); 1923, 1,114,885 tons (£1,801,504); 1922, 816,322 tons (£1,154,009). The average price per ton in the past eleven months was £1 14s. 11·7d. The London County Council have found occasion to get on the track of some of the retailers of coke, who have been selling short measure. For this, they do not blame the producers in any way; but they have urged that legislation should be introduced to insist that coke should be sold by weight.

SECONDARY PRODUCTS.

Allusion has already been made to the position of gas coke in the markets and to the continued satisfactory demand which has enabled prices to be kept at a fair level. On that point we need say no more in this reference to secondary products. Regarding tar, in 1923 a downward movement of value set in; but the decline was not then to a materially serious extent. But this year there has been a complete break in prices. Our market reports in January showed average prices for tar ranging between 66s. 6d. and 71s. 6d., while towards the end of the year the market reporters had to announce figures as low as 31s. 6d. to 36s. 6d. The same thing has happened in connection with pitch. Early in the year, makers appeared to be well occupied with orders for this material. Prices were varying, according to situation, between 92s. 6d. and 100s., and some producers were hoping to get beyond these figures. But the year winds up with prices having followed tar, and recent quotations according to position varying between 46s. 6d. and 52s. 6d. At the moment in this market things are very quiet; but it is hoped that some important contracts will be effected in the New Year. There is some hope that with a strong Government in power, and the steadying influences that are already being felt in industry, the industrial position will improve in those directions which will be of assistance to secondary products. Technically there has not been much to record in connection with the treatment of tar during the year; but a novel plant for dehydrating it by molten metal has been noticed. One of these plants has been erected, through the Woodall-Duckham Company, by the T.I.C. Company, at Glastonbury; and the results of the working show a very high efficiency and good economy.

We will not refer here to the movements of the derivatives of tar distillation, except in respect of benzole. Our market reports showed that at the beginning of the year 90's were quoted at 1s. 0½d. to 1s. 1d.; and at the end, 1s. 4d. to 1s. 5d. Crude benzole 65's (at 120° C.) was quoted early in January at 9½d. to 10d., and recently at 9¼d. to 10¼d., naked at makers' works; naked in the North in January, at 1s. 5d. to 1s. 7d., latterly 1s. 2d. to 1s. 3d. The retail price of benzole has fluctuated considerably during the year. At the beginning of February, it was raised by 4½d. per gallon. On Sept. 10, we announced that, coincident with the price of petrol being reduced by 3½d. per gallon, the National Benzole Association had announced a reduction of 3½d. in the retail price of 50-50 mixture and "National" benzole. Shortly afterwards, there was a further drop of 1d. in the London zone.

In the course of the year, a great deal has been heard of the processes of benzole extraction; and attention has been given to the utilization for the purpose of activated carbon and silica gel. By many experts this is regarded as a very promising development. A feature to be noticed is that while the production of benzole has greatly increased in the United States and in Germany, in Great Britain it has declined considerably—mainly on account of the competition of low price petroleum spirit. In 1918, when the large gas undertakings were washing their gas, the production was 26,400,000 gallons. In 1922 it had been reduced to 11,155,757 gallons; while it is estimated that if there was universal washing of the coke-oven and town gas made in Great Britain, it would yield about 46,000,000 gallons. During the year, Mr. Godfrey Claxton was appointed Research Assistant to the Joint Benzole Research Committee of the National Benzole Association and the University of Leeds. He is to work in the laboratory of the Department of Coal Gas and Fuel Industries in the University, or in suitable industrial establishments, according to the demands of the investigations in progress. An interesting feature is that during the eleven months ending November, 1,290,241 gallons of benzole were exported, as compared with 1,780,970 gallons in the same period of 1923.

Regarding sulphate of ammonia, during 1923 there was a gradual increase in the quantity exported. The exports have been further enlarged during the current year; and for the eleven months ending November, the quantity shipped was 253,155 tons, as compared with 230,598 tons in the corresponding period of 1923. There have been fluctuations in prices during the year, which commenced with £15 2s. per ton for neutral quality on the basis of 25¾ p.ct. ammonia. The basis of quotation has since been altered by the British Sulphate of Ammonia Federation. To facilitate comparison with nitrate of soda, the maximum price is now quoted for 21·1 p.ct. nitrogen, instead of on the ammonia basis. To get an exact comparison of price with nitrate of soda, the price of sulphate of ammonia should be multiplied by 15·5, and divided by 21·1. On the nitrogen basis, prices gradually rose until, for December delivery, they were at £14 8s.; but this was still about 20 p.ct. under the parity of the retail price of nitrate of soda. The price fixed for January, 1925, is £14 10s.; for February, £14 12s.; and for March, £14 14s. At these figures sulphate of ammonia provides the cheapest form of nitrogen available.

At the recent meeting of the Sulphate of Ammonia Federation, Ltd., the report of the Executive Committee and the illuminating address delivered by Mr. Milne Watson showed how greatly the output of ammonia products has increased throughout the world, owing largely to the synthetic process. The position to-day proves that the past policy of the Federation in regard to prices has been the correct one; and their present policy in utilizing every means—quality, propaganda, and a close scrutiny of movements in all parts of the world—firmly to establish in the markets British sulphate production is the one which should be supported solidly throughout the country. It may be mentioned that the production of synthetic ammonia at Billingham has now assumed large proportions; and there are likely to be developments. The Synthetic Ammonia and Nitrates, Ltd., however, who are the owners of the Billingham factory, are members of the Sulphate of Ammonia Federation. Various contributions have been made during the year to the subject of the efficiency of sulphate of ammonia production—an important matter when so many returns indicate low efficiency. In regard to the applications of sulphate, a short time ago a very interesting visit was paid to Rothamsted to inspect the experimental work which is being carried on there, and which has so fully demonstrated the virtues and value of sulphate of ammonia.

GAS REGULATION ACT.

The Director of Gas Administration (Mr. H. C. Honey) and his staff have been very busy again this year dealing with the work involved by the Gas Regulation Act. Several inquiries have been held in respect of applications for Special Orders; also into applications for amending standard prices in the lower direction in view of the altered economic circumstances. And the change-over, under section 1 of the Act, to the therm basis has been proceeding. During the Institution meeting, Mr. Honey, in a speech at the President's luncheon, stated that power had been given to 415 companies to work on the therm system and to 134 local authorities — making altogether 549 undertakings. There were then 65 companies who had not obtained power to charge by the therm, and 167 local authorities. The 65 companies, however, only represented 3 p.ct. of the total amount of gas sold by statutory companies; so that 97 p.ct. of the gas output of the companies was being sold under the therm system. Of course, in the past six months further progress in issuing Orders has been made; and, therefore,

the outstanding concerns at June last will have undergone a considerable numerical change. The favourite declarations of calorific value still range between 450 and 500 B.Th.U. So far, the recording calorimeter has not been definitely prescribed.

CARBON MONOXIDE.

At intervals there have been attempts to revive the question of carbon monoxide. For example, there was the singular attack of Dr. H. Osborne, the Medical Officer of Health for Salford, regarding the carbon monoxide in the products of combustion of gas fires, in which he ignored relative comparison, practical experience, and the trend of popular favour for gas fires. It must be expected that at times statements will be made in this and other respects as to gas which are entirely opposed to actual experience. As against these little outbursts, a report by Mr. W. J. Atkinson Butterfield to the Board of Trade on the subject of carbon monoxide in gas was highly favourable to the gas industry and the utilization of their primary product for heating and other purposes. The exploration made into the cases of death from gas poisoning apart from suicides proved two things: (1) That the statistical evidence did not support the idea that fatalities from gas poisoning have relation to the percentage of carbon monoxide in gas; and (2) that the economic interests of the public would not be served by any restriction. Mr. Butterfield also sought to show that the practical line of attack in reducing fatalities from the already low average is in systematic inspection—periodically and with such frequency as is demanded by the conditions which in different supply areas assail the integrity of fittings and appliances or assist in their preservation in good working state. Mr. Butterfield's researches prove that in practice the increasing admixture of gas (during the past thirty years) containing a larger percentage of carbon monoxide has not affected materially the number of fatalities from accidental gas poisoning, and that the variation in the number of fatalities depends primarily upon other factors than the difference in the proportion of carbon monoxide in gas. The report was fully noticed and commented upon in the "JOURNAL" at the time of its issue; and therefore here we will only remark that there were two recommendations which may have an important—and beneficial—influence upon the future work of the industry. In the first place, it was suggested that the gas industry should be asked to submit to the Board of Trade at an early date proposals for a system of periodical inspection, and of maintenance in safe condition of gas piping, fittings, and appliances in dwelling-houses. Secondly, that these suggestions should, subject to such conditions or modifications as the Board of Trade think necessary, be the basis of a scheme of inspection and maintenance which all gas undertakings specified by the Board shall be required to adopt and carry into effect without delay. The makers of gas appliances, it was also proposed, should be brought in to collaborate in the elimination of unsound and unsafe appliances, including flueless heaters and geysers without proper and adequate vent to the open air. On the invitation of the Board of Trade, the National Gas Council have appointed a Committee to investigate and report upon these recommendations. For the moment, there the matter stands.

At the Manchester Smoke Abatement Conference, in a lecture by Dr. Leonard Hill, F.R.S., Director of the Department of Applied Physiology at the National Institute of Medical Health, there are words of condemnation of those who are constantly making "quite erroneous statements regarding carbon monoxide poisoning from gas." What he said largely destroys the assumptions of Dr. Osborne. The high carbon monoxide content of the combustion products of gas fires is infinitesimal compared with that of the products of combustion of coal and other solid fuel. Both science and practical experience are opposed to the assaults on gas that are made by those whose knowledge of the subject is somewhat limited.

GAS BUSINESS.

We started the year with the sincere wish that all connected with the gas industry would, through its operations, have as prosperous a year as it was possible to obtain from the then prospective conditions. At that time there were signs of an industrial revival in the country. Unfortunately, this has been slow moving; and the end of the year sees a large amount of inactivity in industry, and consequently a sum of unemployment not far short of that which existed in the earlier months. But the year has been a good one for gas sales; what these will grow to when there is greater prosperity in the land cannot be visualized. The increasing sales during the year are, in the first place, due to the reductions in gas prices that were made in 1923. The greater activity that has been developed in connection with the gas-selling and public service departments is also bearing good fruit. The influence of Wembley, and of the large advertising scheme in connection therewith, together with the bad weather experienced almost throughout the year, have combined to stimulate the business of the industry. From all quarters, we hear of a boom in the demand for gas appliances; and therefore there is anticipation that, when the accounts of the different undertakings for the year are available, we shall see fairly considerable percentage increases in the consumption of gas. If this is so, the advances will be upon the remarkably good year of 1923. In no direction have we lost position. This is as it should be. Progress has been made in the design and efficiencies of all classes of gas appliances. There has been good adoption for outdoor and shop lighting of superheater clusters of small inverted burners; and these have also been made available for private lighting. Two good installations which should be very effective in carrying conviction to lighting authorities generally are the lighting by these lamps of the Scarborough sea front, and the New Street Railway Station, Birmingham. In connection with gas cookers, the higher efficiency models have now their supporters in designs suitable for the smaller custom; and we hear of work proceeding here and there in the remodelling of the hotplates of cookers to the new designs in order to give existing users the benefit of the higher efficiency and economy obtainable from them. In regard to gas fires, although there is not much change in design, their range is so large that all circumstances can be easily met. For them the large demand which was experienced in the winter of 1923 has been continued this year. As to water heating by gas, good progress is reported. Reference may here be made to the valuable piece of work accomplished by the Gas Appliances Sub-Committee of the National Gas Council in the specification for the construction and fixing of geysers. Just recently the question of hiring-out gas engines to manufacturers has been discussed at the instance of Mr. Harry Clark, of Derby. The case for extending operations in this direction will be found set forth in the "JOURNAL" for Dec. 3. Towards the end of the year, an Industrial Salesmen's Circle was formed, which it is believed will, through the facilities that will be afforded for obtaining information, have a large effect in promoting gas business and utilization efficiency in the industries.

There has been a large amount of discussion on the subject of organizing good service in the gas industry. The frequency with which this topic is considered augurs well for developments in this direction. The subject of the inspection, adjustment, and maintenance of gas fittings has also been well to the fore; and there will be developments of this through the work now proceeding as a result of Mr. Butterfield's recommendations. This should be of vast benefit, particularly in view of the admission of some of the ironmongers of the country that they stock and sell the cheap and indifferent fittings which cross to this country from Continental sources.

During the reign of the Labour-Socialist Government, there were strong indications of favouring the electricity industry at the expense of the taxpayers and of the gas industry. There was not only a proposal to subsidize by the payment, for a period of years, of the interest on capital expended for new transmission lines and distribution services in country districts, but similar subsidizing was to apply to the equipment of houses with electric wiring and appliances. Very strong protest was made regarding this by the National Gas Council; and it was pointed out that, if financial assistance of the kind was to be rendered by the Government to the electricity industry, the same consideration should be extended to the gas industry. The excuse for this subsidizing was placed at the door of unemployment. One of the inexplicable features of the year is the ardent or assumed (for platform purposes) belief of the labour leaders that in electricity—electric heating and cooking and all else—is to be found economy, and easing of labour for the working class. The lack of knowledge disclosed by this suggests inefficiency in leadership.

WORK OF THE INDUSTRY'S ORGANIZATIONS.

It has been a busy year for the industry's central organizations. But space will not permit of any detailed reference to their proceedings. All of them had part in the Wembley Gas Exhibit, and all did their best to promote its success. The National Gas Council, under the presidency of Mr. D. Milne Watson, pursued their work, in many ways and in relation to numerous political and other subjects, in the defence and furtherance of the interests of the industry. There is no end to this class of essential work. The larger a progressive industry grows, the more noticeable it and its operations become. As the process of expansion proceeds, there are some obscurants who would like to forge a few more shackles for its feet; and there are others who are of opinion, though change is taking place all round, that the circumstances of the industry should be immutable, and so oppose everything relating to altered needs. This is exemplified by the suggestions and efforts that are being made by county councils and others to revise the law relating to pipes, cables, &c., in highways or roadways, to their own advantage and to the detriment of public utility companies and, through them, of the public. Further instance of this is found in the incessant hostility of the railway companies, and the difficulties of coming to agreement with them, as witness the insufficiency of main capacity clause, which, it is hoped, is now in a fair way to settlement. Again, there is the action of the Metropolitan Water Board as to the connection of geysers to water mains. These are only examples of current expeditions of various authorities against the industry; but in all their work the Council know that they have at their backs those responsible for 87 p.ct. of the gas supplied in the country. There is strength in that knowledge. The Gas Companies' Protection Association, under the chairmanship of Dr. Carpenter, also maintain very watchful care over the interests of gas companies, and do much in an advisory capacity. Glancing over the history of the organization brings to mind many notable fights.

The Institution of Gas Engineers continue to preside effectively and efficiently over the technical work of the industry. In the first half of the year and until the end of the annual meeting, the Institution pursued their developing way under the presidency of Mr. Samuel Tagg, who in that capacity rendered in many ways yeoman service to the industry. His successor in the presidency is Mr. J. Ferguson Bell, who is serving the industry and all with any part or lot in it with a fervour borne of faithfulness to trust. The annual meeting was marked by a richness of material and fulness of interest—whether regarded from the points of view of the reports presented by the Gas Investigation Committee of the Institution and the University of Leeds and other Committees, the papers and discussions, or other attendant circumstances. The meeting was so arranged that a large number of members were able, on the invitation of the President and Committee of the Société Technique du Gaz, to visit Paris to join in the celebrations connected with the centenary of gas supply in France and the Jubilee of the Société. The courtesy, the bonhomie, the cordial fraternization during the visit will ever be remembered by the participants. It did a good part in adding to the bonds of the long friendship that has existed between the gas men of the two nations.

The "B.C.G.A." have had a year of stress and of triumph. The organization took a prominent part in the details of, and work associated with, the Wembley Gas Exhibit; and yet, despite the immense claims made by it upon the time and thought of the officials, they did not neglect the normal propaganda and educational work of the industry; it proceeded as usual—no opportunity being lost. Of course, Wembley not only involved a large amount of work, but it was an impetus to do more wherever an opening for it was seen. District conferences were held as usual. The annual meeting at Liverpool, under the presidency of Mr. H. Wade Deacon, was a brilliant success, and contained certain novel features, which opened new avenues of thought as to the influences upon daily life of refinement in our work, dealings, and surroundings.

The Society of British Gas Industries had an excellent year—first under the presidency of Lord Weir, and now under that of Mr. D. Milne Watson, whose tenancy of the office is another exemplification of the unity and interdependence of both sides of the industry. Mr. F. C. Tilley was the Chairman of Council during the greater part of the year; and his successor is Mr. J. Wilfrid Drake.

The District Associations of Gas Engineers and Managers, the Junior Associations, and the Gas Salesmen's Circles have all made valuable contributions to the furtherance of the technical and commercial work of the industry. The Joint Meeting of the Salesmen's Circles at Wembley was a success in numbers, educationally, and from the point of view of new stimulation. As previously mentioned, an Industrial Salesmen's Circle has been started; and another newcomer which we have welcomed during the year has been the Institution of Public Lighting Engineers and Superintendents, with Mr. S. B. Langlands as first President and Mr. W. J. Liberty as Hon. Secretary. There is valuable work before the members.

LEEDS UNIVERSITY.

The Coal Gas and Fuel Department at the Leeds University gains in indispensability to the gas industry. The researches carried out by Prof. Cobb and his diligent staff, on behalf of the Joint Gas Investigation Committee of the Institution of Gas Engineers and the University, furnished another considerable supply of technical material to the annual meeting of the Institution, which threw further light upon problems that hitherto have not been explored with similar thoroughness and exactitude. Prof. Cobb was able to issue an excellent annual report as to good work done by his Department, and upon its enlarging prospects. Lectures and courses have been modified and extended as requirements and experience have dictated. The resources of the Department have been greatly added to by the experimental gas plant erected as a memorial to the late Sir Corbet Woodall. This memorial is a fit supplement to the one to Sir George Livesey, which is the foundation of the Department and of the Chair occupied by Prof. Cobb. In our opinion, it will add materially to the attractions of the Department for those training for professional office in the gas industry.

It will be remembered that Prof. Arthur Smithells relinquished the Chair of Chemistry at the University in 1923. Many of his friends in University life, former associates and students, and others—particularly in the gas industry—desired to commemorate in some way the nearly 40 years' work he had rendered to the University with effects richly beneficial to that seat of learning, to those officially associated with it, to past, present, and future students, and to industries in which science is applied. The commemoration took the form of an oil painting (which is to grace the walls of the University in company with the portraits of other men who have helped to build up the University to its present status) and the founding of the Smithells Scholarship. The commemoration was made the occasion recently of a meeting at the University, at which representatives of those who have known Prof. Smithells throughout his distinguished career had an opportunity of placing on record their feelings towards him and their indebtedness to him. The Centenary of the foundation of the Yorkshire School of Science and the coming-of-age of the University have also been celebrated. Full reports of these notable events have appeared in the columns of the "JOURNAL."

THE EDUCATION SCHEME.

A year ago reference was made to the preliminary and inaugural work associated with the introduction of the education scheme of the Institution of Gas Engineers. This year we have seen the first workings through the examinations held in May. Then 60 candidates presented themselves—36 in section 1 and 24 in section 2; and to the credit of candidates two diplomas were gained. Many other candidates were successful in the examinations. Altogether, it must be admitted that, as an introduction, the number presenting themselves for examination is a matter for congratulation. But the examinations had their lessons. They disclosed in some cases a want of preparation—a failure to appreciate that the fundamental object of the scheme is to secure higher qualification in the ranks of the technical personnel of the industry. Perhaps time must be permitted for the younger men of the industry to be educated up to the fact that higher qualification is, in the circumstances of the affairs of the industry to-day, required of them—that advance must be made in qualification as in other directions. A memorandum on the subject prepared by the Organizing

Secretary, Mr. Walter Hole, based upon a report of the Advisory Committee, will have impressed future intending candidates as to the need of a higher standard of preparation; and this applies also to those engaged in their teaching and training. Experience during the first year of the operation of the scheme has also disclosed where amendment can be effectively applied, in order to make it of more beneficial use. Some of the conditions were obstructive to the presentation for examination of eligible candidates; but in this and other respects there has recently been modification and a perfecting, which become immediately operative, and so will be at once advantageous in promoting the results intended to issue from the scheme and the examinations. A similar condition of affairs—want of preparation—was also found in criticisms that appeared in the reports of Mr. H. Kendrick and Mr. R. J. Rogers, respectively the Examiners in "Gas Supply" and "Gas Fitting" to the City and Guilds of London Institute.

MISCELLANEOUS.

There are many other subjects upon which we should have liked to touch in this somewhat superficial survey of the affairs of the gas industry in the past year; but circumstances will not permit. We cannot, for instance, deal with those numerous labour questions which have at times overshadowed the country and affected all industries alike. But we can claim for the gas industry peaceful and good relations, generally speaking, between gas undertakings and their employees. There have been little eruptions and disagreements here and there; but nothing that it has not been possible to compose, through the agency of negotiation and give-and-take. There was an amendment of the wages sliding-scale during the year, which was advantageous to the men.

We should also have liked to enlarge on distribution topics in addition to those affecting rights which come under the surveillance of the National Gas Council. For example, Mr. Walter Hole has dealt with the subject of rubber joints for gas mains; and this has excited world-wide interest. Mr. T. P. Ridley appeared, on behalf of the National Gas Council, before the Royal Commission on Mining Subsidences, to state the claims of the industry in respect of their distribution systems in areas subject to such subsidences. Mr. Stephen Lacey, B.Sc., contributed to our pages two valuable flow of gas tables and an explanatory article, which supplemented the value of the paper he gave before the Institution of Gas Engineers in 1923.

There is also the gas stock and share market. A considerable amount of business has been done during the year; and many issues of new capital have been made. Generally speaking, the market values of the stocks and shares, comparing the first weeks of the year and now, have somewhat improved—certainly it can be said that ground has not been lost. There has been occasion during the year to make much criticism as to the activities of promoters who use the good reputation of the industry for launching on the public small undertakings with extraordinarily large capitals. Their extravagant methods of doing this deserve the utmost censure; and the view has been expressed on more than one occasion that some definite action should be taken to protect shareholders in existing well-established undertakings from their machinations.

AS TO THE FUTURE.

With a stable Government in power and with a settled political policy, there is every prospect that the industries and the trade of the country will improve; and whatever is achieved in these directions will bring good influence to bear upon the fortunes of the gas industry. There is little prospect that coal prices will sink to a more favourable level; and as to secondary products, all that can be hoped is that, with a revival of industry and trade, the demand will be such that higher prices will result. However, in present circumstances, the industry is enjoying prosperity. Through the developing consumption of its primary and chief secondary products, the ambit of the business of the industry is being largely extended; and much work is being done along the line of public service which must have a creative influence. With the improvement of trade and the prospect of a gradual reduction of the burden of taxation, there is good hope that the present prosperity of the industry will not only be continued, but will be enlarged—to the benefit of its customers and all engaged in it. In this vein of thought we are able to conclude this survey of the past year's operations with fair confidence, by wishing our readers—

A FULL MEASURE OF PROSPERITY DURING 1925.

Honours.

We congratulate the Council of the Institution of Gas Engineers upon their heartily passed resolution to nominate Dr. Carpenter as the next recipient of the Birmingham Medal. The work that the President of the South Metropolitan Gas Company has done for the gas industry is so well known, and of such intrinsic value, that there is no need to say anything about his worthiness for the distinction. Of it he was richly deserving long ago; and since then his services to the industry have been accumulating. It is also proposed to nominate for the roll of honorary members Mr. Charles Hunt, Mr. Harry E. Jones, and the President of the Canadian Gas Association. The members of the Institution will have the opportunity of endorsing these recommendations at the annual meeting, which is to take place from June 9 to 13, under the presidency of Mr. J. Ferguson Bell.

The London Gold Medal.

The London Gold Medal, which is for the best paper (submitted to the Institution) dealing with a subject of technical interest to gas engineers, is to be made available for presentation annually—thanks to the generosity of Mr. H. E. Jones, who is presenting to the Institution securities of sufficient value to make this possible.

Ironmongers and Gas Fittings.

Correspondence on this subject has been continued in the "Ironmonger." In a further letter by "H. M. T.," he states that his "experience is that England only holds the market in gas fittings—as in many other goods—in the very best qualities, and that what cheap burners and globes we do make are far worse in quality than the corresponding foreign goods." Our experience does not support that statement. But anyway, whether "H.M.T." is right or not, the gas industry has under consideration how best it can eliminate poor quality fittings and inefficient appliances, no matter what their origin. A sensible remark of "H. M. T." is: "I certainly think the buyer should concern himself more with the article itself—its quality and its price—than with the country of origin." If all ironmongers would do that, and do it with knowledge to guide them, there would be less of which to complain. But there is no universal evidence of the existence or the exercise of such knowledge.

Exports of Sulphate of Ammonia.

In last week's issue figures were given as to the exports of coal and gas coke during November and for the eleven months of the year. The quantity of sulphate of ammonia shipped in November was 26,188 tons, as against 19,005 tons in the same month of 1923. In the eleven months of this year, 253,155 tons were shipped, compared with 230,598 tons in the corresponding period of 1923.

Tar Products Shipments.

In this class of exports, it is seen that only 1053 gallons of benzole were exported in November, compared with 214,830 gallons in November, 1923. In the past eleven months, benzole exports totalled to 1,290,241 gallons, compared with 1,780,970 gallons. Exports of naphtha have also declined. Only 2681 gallons were sent abroad last month, as compared with 103,791 gallons in November, 1923. In the eleven months, 165,107 gallons have been shipped, compared with 231,674 gallons in 1923. In tar oil, creosote, &c., good business was done in November; the aggregate being 4,370,276 gallons, compared with 1,561,826 gallons. In the eleven months, the shipments were 40,400,328 gallons, compared with 44,253,480 gallons.

PERSONAL.

Mr. J. H. RANFT, Manager of the Lytham-St. Anne's Gas-Works, has been presented by the Chairman of the London, Midland, and Scottish Railway Company (Sir Guy Granet, C.B.E.), on behalf of the Board of Directors, with a handsome solid silver tea and coffee service on a salver bearing the following inscription: "Presented to John Henry Ranft by the Board of Directors of the London, Midland, and Scottish Railway Company, in grateful recognition of his voluntary and invaluable assistance at Moss Side, Lytham, on Nov. 3, 1924." It will be recalled that Mr. Ranft's promptitude in the recent railway disaster at Lytham, and his excellent services for the benefit of the passengers, met with gracious appreciation at the inquiry held in the district into the cause of the mishap.

CHRISTMAS AND NEW YEAR'S GREETINGS.

WE have to acknowledge the receipt of seasonal kind wishes from many readers and business friends, which we heartily reciprocate. From the Lord Mayor and Lady Mayoress of Manchester (Alderman and Mrs. F. J. West) there have come Christmas

and New Year's Greetings. These are conveyed on a card of allegorical and highly artistic design. A photographic reproduction is given here; but the beauty of the delicate colouring is, of course, lost.

Manchester and District Junior Gas Association.—A visit has been arranged to the works of the National Gas Engine Company, Ltd., for Wednesday afternoon, Jan. 14. Members will assemble at the offices, Wellington Road, Ashton-under-Lyne, at 3 o'clock. After tea in the works canteen, Mr. A. Cook, of Warrington, will read a paper entitled "Some Notes on Gas-Works Practice."

ELECTRICITY SUPPLY MEMORANDA.

THE Electrical Trades' Union are opportunists of the first water. They seem to be ever watchful for occasions to take action to gain their ends when they think most damage can be inflicted upon the public. It is always the poor public, though in no wise parties to their disputes, who are marked to be the victims of their fatuous policy. The means are worthy of cowards. Take, for example, the trouble that has recently been averted in connection with the Brompton and Kensington Electric Supply Company. This arose over two of the workers at the electricity station having seceded from the Union. Their withdrawal was not a matter that had taken place within immediately recent times; and there was no burning importance to deal with it just prior to Christmas. Nevertheless, the Union considered it a very appropriate time. The peak load of inconvenience could be brought to bear by having a strike while Christmas business was at its height, and while the customers of the Company wanted artificial light to enable them to enjoy to the full their Christmas festivities and family reunions. Though the default of two workers constituted a small matter, there was no time like Christmas for applying despotic power to induce the Company to discharge the men or compel them to return to the Union fold. The Company would have nothing to do with the Union demands. The difference was entirely one between the Union and the two men; but the former threatened to withdraw all labour if there was not compliance with their ultimatum before three o'clock on the afternoon of Tuesday, Dec. 23. The Company believed in their ability to carry on, and held firm. The two men who caused the trouble and provoked the threat acted admirably. They put an end to the difficulty by paying the re-entry fee, so resuming their allegiance to the Union. The incident, however, shows how this Union utilize the weapon of maximum inconvenience to the public for gaining their own ends.

Strategic Fatuity.

The Light that Fails.

If it is necessary to make provision of emergency lighting in certain places because of the innate weakness of electricity supply to fail at inopportune times, it must be essential in all cases, unless, of course, users enjoy the experience of being suddenly deprived of light. The London County Council insist on duplicate systems of lighting in all places of entertainment in London, and correctly so, seeing that it is only right that the public should be protected against the possibility of being left in darkness inside a crowded building. The electrical people are giving up talking about their supply being most reliable. They know that people who have suffered, and never know when the experience will be repeated, only laugh at such pretensions. "Meteor" in the "Electrical Times" practically admits that the trouble of failure is inherent in electricity supply, and that it appears impossible to avoid it, though every precaution should be taken against such happenings. To use his own words: "It seems improbable that absolute perfection can ever be attained in electric lighting or any other invention of mankind, in spite of the most scrupulous precautions against failure." "In any case it would be foolish to regard failure as impossible, especially in the case of operating theatres in hospitals." Our friend (in his issue for Dec. 18) said the electric light was extinguished on the previous Monday night in the operating theatre of St. Peter's Hospital, Henrietta Street. When this happened, a patient had just been put under an anæsthetic, and the surgeons were starting to operate. Two powerful emergency lamps taking current from a battery were at once switched on, and the doctors completed their work quite successfully. This has not always been the case, through the want of the necessary provision. It seems obvious to "Meteor" that emergency lighting should be provided in these very special cases. If so, then convenience claims the provision in other cases. We know of more than one friend who regard it as "obvious" that for their own protection stand-by lamps to electric lighting are an essential. One of them has a paraffin lamp ready trimmed in every room; and past experience so much justifies the precaution that he will never be without them. His advice to his friends is: "Do as I do in this matter." Sometimes a failure has its humorous side. In the report of a recent meeting of the Hythe Chamber of Commerce, several members spoke of the somewhat frequent failures of the electric light. One of them, a hairdresser, stated that, on one occasion when all the lights went out, he had a lady half shampooed, another lady half shingled, while a gentleman was in a bath, and another was half shaved. There is something humorous in such situations, but not for the subjects. In the week preceding Christmas, when shopping was at its height in a suburban locality, the electric-lighted shops in a main thoroughfare were thrown into darkness. The face of one tradesman was such a picture of despair, and another was saying such horrible things, that at any rate one person deferred his shopping to a more convenient season.

What is Progress?

There are different kinds of progress There is the rake's progress; and there is genuine progress from one position to a higher standard. Sometimes "progress" is regarded from the standpoint of self-interest or prejudice. When that is the case,

there may be misinterpretation of the term. The progress we are now considering is something which, through higher efficiency, secures economy or such a higher standard of value that it is worth the money expended. That is not the case in all proposed conversions from gas lighting to electricity. We have met with several instances in which, for a comparatively small expenditure on modernizing gas fittings, a material improvement could be effected in lighting; and yet an electric lighting committee, in the interests of their undertaking and not of the ratepayers, will propose the expenditure of thousands of pounds in transferring gas lighting to electric lighting—giving less efficiency than the displaced gas lamps, or at any rate the modern gas lamps which could have been introduced for less money. Apparently, "Meteor" of the "Electrical Times" would call this "progress." The only progress effected is in the amount of expenditure and not of efficiency. "Meteor" admonishes electric lighting committees of corporations who do not own gas-works for not taking advantage of their position. He would have them ride roughshod over private enterprise. He thinks that any electricity committee in the happy position of not having a gas undertaking in the municipal family might with advantage assert themselves rather more than has been customary.

> Take Sheffield, for instance. The Electric Supply Committee have suggested to the Education Committee that the schools in the city should be lighted by electricity. They have urged upon the Watch Committee that electricity should be used to a much greater extent than at present for street lighting. "It is desirable in the interests of the city," they say. There are some towns where gas interests are strongly represented on the town council; and we have noted one or two discussions of late in which gas lighting was ferociously championed, and a proposal to instal electric street lamps was scornfully turned-down. But where vested interests do not plank down a stone wall across the path of progress, might not electricity committees exert much more influence than they do at present? It is their duty to foster progress.

We have not heard before of stone walls being "planked down;" they are usually built. That by the way. The point is, Is it genuine "progress" that is being advocated? We say deliberately that it is not when a heavier expenditure is needed to secure an improvement in efficiency that could be effected at a lower cost by another agent.

Those Regulations. The Institution of Electrical Engineers have had an informal meeting to discuss the wiring rules; and on the occasion there was the now common diversity of opinion regarding them. The consulting engineers appear to have more difficulty over their application than the electrical contractors—perhaps the latter understand them better than the former. According to a reference to the meeting in the "Electrical Review," the Vice-Chairman of the Wiring Committee (Mr. Ll. B. Atkinson) and other members proved to demonstration that there was nothing in the regulations which ought not to be there, and that the increase in the cost of a complete installation due to the recent revision would be at most 5 p.ct., while in some cases the cost was actually less than before. As to the conditions respecting the earthing of portable appliances, and with regard to flexibles and plugs, it is thought that the electrical manufacturers, though credited with being "slow," will "soon" meet the requirements. As a matter of fact, Mr. E. C. Wansbrough states in the "Electrical Times" that "every manufacturer of good repute is in a position to supply promptly any or all of the required accessories." Leading electrical contractors hold that the increase in the cost of first-class installations would be negligible; but the "Review" would prefer to see a material decrease in cost, particularly in the case of the smaller installations in private houses. Naturally! There are others who do not mind sacrificing safety to secure a "material decrease" in the cost of installations, which is one of the several obstructions against which electricity has to fight. The "Review," we see, has joined the ranks of those who would like to see two standards of installation work—one for the opulent, and the other for those who are not. This is what it says: "The regulations may be accepted as representing an ideal worthy of the Institution and of the associated authorities for first-class installations; but there should be a materially modified code or codes for less pretentious premises." Why the difference?

The Boiling-Plate. The writer of "Cooking and Heating" notes in the "Electrical Times" says the electric boiling-plate is still the weakest link of the domestic cooker, though (this to palliate the confession) the "many thousands of cookers now in daily use testify to the progress towards greater reliability that has been made in recent years." Manufacturers realize the weakness; and while continuing to supply plates that will with "reasonable conditions" give satisfactory service, the search still continues for something better—something which will stand abuse as well as fair use. The new protected open type plate now being fitted to the "Tricity" cookers is a concrete example, and a good one. The makers have been staunch advocates of the solid enclosed type plate, though the open type has been supplied to anyone requiring it. Though still holding premier position in efficiency, the solid type plate is slow, owing to the limits of its loading per square inch. The open type plates allow of higher loadings, and so give quicker boiling. Hence the advent of the protected open type. Loaded to 1600 watts, this will give quicker service than the enclosed type, but is not so efficient as the latter, loaded to only 900 watts. The firm now fix one of each type to all their latest cookers. If there was only a small margin of difference between the two, they would not trouble to do this. So users are advised that "for bringing small quantities of liquid quickly to the boil, the protected open type plate should be used, while for operations on which speed is not the first essential—such as boiling greens, puddings, &c.—the fully enclosed plate will do the work equally well, and more economically." So it comes to this, that it is now admitted that the open type plate which was invented to secure quicker work is more wasteful, and so less efficient, than the enclosed type, and, what is equally bad, it is subject to more rapid damage from the spilling of liquids. The search for the more efficient and reliable boiling plate has been going on for three or four decades. It still continues. Besides efficiency being low, electricity is still the dearest heating agent.

GAS METERS.*

Reviewed by Norton H. Humphrys.

Recognized text books on gas engineering fairly cover the construction of ordinary type gas meters, and the later ones deal with construction of the prepayment variety to a less extent; but all are somewhat meagre respecting the fixing, maintenance, inspection, &c., of meters. Consequently there are no recognized rules among sellers of gas as to the average working life of a meter which may be expected before a change—or at least a test—is advisable or necessary, or the location of a golden mean between excessive administration costs and contributions to the unaccounted-for gas. Systematic inspection of consumers' fittings is steadily making way, and some form of it may possibly be enforced by the Board of Trade. The "advice inspector" is not likely to overlook the possible vagaries of the meter, and one may reasonably expect that *in situ* tests, directed towards "slip" at times of minimum demand, will be generally adopted. In the case of a small consumer running (say) two pilot jets for 7000 out of the 8760 hours in the year, one would like to know how much of the 1000 to 2000 c.ft. so consumed is duly registered and paid for, and how much, slipping through unregistered, goes to increase the evasive "unaccounted for." Many gas engineers and managers must confess that their knowledge of the subject begins and ends with an inspection of a glass-cased model, dissection of a worn-out meter from the district, and perusal of printed descriptions. As it is, the sub-title is rather full, but we should like to see the words "advice inspector" more prominent; holding that officials in constant contact with consumers require an acquaintance not only with structural detail, but with the working and common defects.

A foreword by Mr. Samuel B. Chandler, A.M.I.Mech.E., follows the usual introduction. The author opines correctly "that in many undertakings meters receive less attention than the district appliances," and adds "this book has been written with a view of extending the understanding of meters, and of keeping them on the district only so long as they work efficiently." The subject cannot fail to commend itself to all interested in sales of gas.

Leading points are: Construction, repair shop practice, equipment and management, testing, internal leakage, fast and slow registration, water-lining, testing *in situ*, fixing, relation of prepayment meters to district complaints; a chapter on the various types of inferential meters; hints for the manager, buyer, inspector, storekeeper, and fitter; disputed accounts; and last but not least, facts to remember.

* "Gas Meters, their Construction, Use, Fixing, Maintenance, and Inspection. A Handbook for Engineers, Managers, Inspectors, and Students." By Albert T. Gilbert, late of the distribution staff of the South Metropolitan Gas Company, now Distribution Superintendent to the Nuneaton Gas Company. 8vo. 189 + xii. pp., 70 illustrations. London: Crosby Lockwood and Son. 1925. Price 7s. 6d. Also on sale at the office of the "JOURNAL."

The New Holders at Washwood Heath, Birmingham.

Some notes on the two holders and tanks which are now being constructed at the new Washwood Heath Works are contributed by Mr. J. H. Willis to the Birmingham Corporation Gas Department Magazine. As at present arranged, each holder will have a capacity of nearly 6 million c.ft., but when later on two lifts are added this will be increased to 10 million c.ft. The concrete tanks are to be 254 ft. in diameter, with a depth of 45 ft., and each will hold 10 million gallons of water, which is approximately equal to the daily consumption of water in the city. The Birmingham Town Hall could be placed within the walls of either of these tanks, and then there would be room to spare. In the course of the construction of the concrete work it was necessary to excavate 170,000 tons of earth; while there were employed in the mixing of the concrete approximately 4500 tons of cement and 30,000 tons of sand and gravel. In addition to this 20,000 tons of clay puddle were used. The last named was placed behind the concrete walls, as a precautionary measure, to stop any leak which might occur through the walls themselves. These walls are, however, 4 ft. 6 in. thick at the bottom and 3 ft. at the top of the tank. The puddle was placed against the wall on the outside in a layer 2 ft. thick, extending from top to bottom.

INSTITUTION OF GAS ENGINEERS.

Council Meeting.

A Meeting of the Council of the Institution of Gas Engineers was held at the offices, No. 28, Grosvenor Gardens, Westminster, on Monday, Dec. 8, when there were present Mr. J. Ferguson Bell (President) in the Chair, Mr. Charles F. Botley (Vice-President), and Mr. Samuel Tagg (Past President); Messrs. J. E. Blundell (Carlisle), J. M. Campbell (Margate), W. E. Caton (Oxford), C. Dru Drury (Sunderland), D. H. Helps (Reading), Percy N. Langford (Coventry), H. D. Madden (Cardiff), John W. M'Lusky (Glasgow), C. S. Shapley (Leeds), W. J. Smith (Bolton), J. Wesley Whimster (Bath), ordinary members of Council; and James Campbell (North British Association), Harold Davies (Manchester District Institution), William C. Jackson (Wales and Monmouthshire District Institution), Edward F. Keable (Eastern Counties Association), and Leonard J. Langford (Southern Association), district members of Council; W. E. Price (Hon. Secretary); and, by invitation with reference to the Education Scheme, Mr. F. W. Goodenough and Mr. Walter Hole; and Mr. A. E. Broadberry in regard to the Report on Standard Methods for Testing Gas Cookers.

The minutes of the previous meeting at Liverpool were confirmed.

Expressions of regret at absence were reported from Mr. John Wilkinson (Vice-President), Mr. T. Hardie and Mr. J. D. Smith (Past Presidents), Mr. Hubert Pooley (Leicester), and Mr. S. Shadbolt (North of England Association).

It was reported that the congratulations of the Institution had been transmitted to Mr. John H. Ranft, Engineer of the Gas-Works, Lytham, on the splendid qualities which he had displayed on the occasion of the railway disaster there; to Sir Dugald Clerk, F.R.S. (Past President), on his having been awarded the Royal Medal of the Royal Society; and to Prof. C. V. Boys, F.R.S., on his having been awarded the Rumford Medal of the Royal Society.

The acceptance by the Institution of Electrical Engineers of an engraved plate for the production of a certificate for presentation to successive presidents was announced. It has been designed by Mr. F. D. Marshall, who designed the Certificate for the Institution of Gas Engineers which was presented last June. The certificates are nearly identical in appearance.

The American Gas Association's appreciative acknowledgments of the Institution's message of greeting on the occasion of the Annual Convention in Atlantic City were reported; as were also the arrangements for the representation of the Institution at the Jubilee of the Leeds University as the Yorkshire College of Science, taking place from Dec. 15 to 20. The address of congratulation from the Institution was duly sealed.

Approval was given to a proposal for the erection in Grosvenor Gardens of a memorial to the officers and men of the Rifle Brigade, which is to be unveiled by H.R.H. The Duke of Connaught, the Colonel-in-Chief of the Regiment, early next summer.

Messrs. Caton and Helps were appointed scrutineers of the ballot-lists for the election of new members and associate members, and subsequently reported that the following had been found to be duly elected:

Members: Messrs. Harry Banks (Northampton), John E. Borresen (Copenhagen), F. H. Buckley (Formby), T. R. Cook (Southport), James Dickson (Kirkintilloch), Charles E. Holt (Wilmslow), John Hood (Shrewsbury), Hugh Hughes (Melksham), A. Gordon King (New York), S. E. Logsdon (Pernambuco), John J. Merrell (Sutton-in-Ashfield), Walter Muller (Santiago), S. T. P. Perry (Brentford), Harold Robinson (Annan), T. W. Smith (Whitworth Vale), Ernest P. Stevenson (Buenos Aires), John E. Sutton (Ramsbottom), Robert Sturrock (Ardrossan), W. A. S. Vardy (Normanton), and Norrie Willsmer (Brentford).

Associate Members.—Messrs. L. M. Adams (Brentford), E. W. Bennett (Brentford), Cecil Harry Chester (Wakefield), W. W. Chisholm (East Hull), Thomas A. Clare (Brentford), Clifford Duncan (Hull), John K. Grant (Sydenham), F. W. Howard (London), Harold Jack (Southport), Bernard Kelham (Melbourne), Gilbert Langstreth (Burnley), Stuart Pexton (Westminster), R. Prince (Heywood), H. H. Redwood (Dorking), E. B. Shaw (Stoke-on-Trent), Sydney Smith (Birkenhead), Francis White (London), E. W. Willis (Brentford), and G. A. Wright (Bristol). Mr. Samuel J. D. Williams, Assistant Engineer at Stourbridge, was approved as a candidate for the class of associate member.

Messrs. Ralph Halkett, Jun. (Sheffield), A. H. Nicholson (Stockton-on-Tees), John Roberts (Bingley), and John E. Wakeford (Stockton-on-Tees) were admitted as students of the Institution.

The arrangements for the annual general meeting of the Institution to take place from June 9 to 13, 1925, were further considered, including papers for reading and discussion.

It was unanimously resolved that the President of the Canadian Association, Mr. Charles Hunt, M.Inst.C.E., Past President, and Mr. Harry E. Jones, Past President Inst.C.E., Past President, be nominated for election as Honorary Members of the Institution at that meeting.

The award of the Birmingham Medal was considered, and it was resolved by acclamation that Dr. Charles Carpenter, C.B.E., should be nominated for this distinction.

The Report of the Sub-Committee of the Gas Investigation Committee on a communication received from the National Gas Council with respect to the Report of the Gas Investigation Committee on Standard Methods for Testing Gas Cookers was presented.

It was resolved that the Sub-Committee of the National Gas Council be invited to meet the Sub-Committee of the Institution, with a view to discussing the matter.

A report was presented of a conference with representatives of the National Gas Council, the Society of British Gas Industries, and the Institution, with reference to the proposed preservation of Murdoch's house at Birmingham, and the Murdoch gasholder at Smethwick. It was stated that a further conference was to be held upon the subject, and that recommendations would be communicated to the respective bodies in due course.

It was reported that Mr. Harry E. Jones had intimated his intention to present to the Institution securities of sufficient value to provide for the award annually of the London Gold Medal for the best paper presented dealing with some subject of technical interest to gas engineers. The cordial thanks of the Council were expressed for this munificent gift.

The Report of the Advisory Committee on Education, referring to the period since the last meeting of the Council, was presented, and various questions upon it were replied to by Mr. Goodenough and Mr. Hole. It was resolved that the number of the Committee should be increased from fifteen to twenty, to enable representatives to be appointed by the Irish Association of Gas Managers (2), the North British Association, and the Wales and Monmouthshire District Institution, and an additional representative of the Board of Education of England and Wales. It was also resolved that a Committee of Advice, consisting of members of the Institution in Scotland, be appointed by the North British Association, for the assistance of Scottish students desiring to enter the examinations.

Consideration was given to the request of the City and Guilds of London Institute for the nomination of examiners for Gas-Works Practice, Gas Supply Practice, and Gas Fitting, and it was resolved that the following be nominated respectively: Mr. John Terrace, M.Inst.C.E., Mr. John P. Leather, M.Inst.C.E., and Mr. W. L. Westbrook. The Council cordially expressed their appreciation of the work which had been done by Mr. Samuel Tagg as Examiner in Gas Engineering, Mr. H. Kendrick as Examiner in Gas Supply, and Mr. R. J. Rogers as Examiner in Gas Fittings.

It was reported that the "Daily Express" had offered a series of scholarships for competition among its readers, connected with various industries, the gas industry being included. The offer was gratefully accepted, and the matter was deferred pending the receipt of further particulars.

In regard to funds required for operating and developing the Education Scheme, it was reported that a Joint Finance Committee meeting of the National Gas Council and the Institution had been held, and proposals were agreed for submitting to the latter body.

Mr. Botley, as Representative of the Institution at the Conference convened by the British Engineering Standards Association to discuss American efforts to introduce American Standards throughout South America, reported what had taken place.

A statement was received from Mr. John P. Leather, as Chairman of the Joint Refractory Materials Committee, indicating the action of a Sub-Committee in considering desirable changes in the present test for refractoriness, and also on the question of nomenclature with respect to the test itself, in order that no confusion may be caused with the angularity test as understood by American and German authorities.

The progress of the work being carried out by the Wrought-Iron Tubing Inquiry Committee was reported, it being stated that a further interim report was expected to be ready in the new year.

The financial statement relating to the Smithells Fund was presented, from which it was shown that the sum of £1137 had been contributed by the gas industry out of the total amount of £2462 6s. 11d. A letter expressing the thanks of the Committee was received.

It was reported that a conference on the subject of Standard Clauses of Contract had taken place with representatives of the Society of British Gas Industries, to consider a communication received from the National Gas Council enclosing suggestions for the standardization of engineering contracts, which had been forwarded to the National Gas Council by the Federation of British Industries. It was agreed that the existing clauses of contract drawn up by the Society of British Gas Industries and the Institution of Gas Engineers fully met the requirements of the gas industry.

A letter was considered from the National Gas Council on the question of the appointing of a representative of the gas industry on the Contracts Committee of the Federation of British Industries. It was resolved that the President of the Institution be appointed.

The resignation of Mr. J. G. Clark as the Institution's representative on the Sub-Committee of the British Engineering Standards Association dealing with glassware was accepted with

expressions of regret, and appreciation of past services. It was resolved that Mr. Albert Stokes, of the South Metropolitan Gas Company, be appointed in his place.

Arrangements were completed for printing and publishing the communications of Sir Dugald Clerk on the Relative Thermal Efficiency of Gas and Electricity.

A letter was received from the National Gas Council, for the information of the Institution, on the question of the right to break up roads when laying mains and service-pipes in highways; and some discussion on the matter took place.

Statements by the Institution's representatives on the Heat Engine and Boiler Trials Committee of the Institution of Civil Engineers (Messrs. W. N. Booth, W. Chaney, H. Hollings, and E. W. L. Nicol) were received. In regard to the statement from Mr. Nicol, it was agreed that the term "Gross Calorific Value" in any documents issued by the Committee would be preferable to the expression "Calorific Value," as ambiguity would be avoided thereby.

The Reports of the Emergency Committee and the Finance Committee were presented, accepted, and adopted.

WILL'S ELECTRIC LIGHTING.*

Reviewed by a Barrister-at-Law.

Readers of the "JOURNAL" will be aware that the late Judge J. Shiress Will, K.C., joint author of Michael and Will's "Law Relating to Gas and Water," was also responsible for a volume of Law relating to electric lighting. The last edition by Mr. W. E. Tyldesley Jones was published twelve years ago, and a new (the fifth) edition has just been issued, for which Mr. John C. Dalton, Barrister-at-Law, is responsible.

A perusal of the book now before us prompts a comparison with the new edition recently published of Michael and Will on "Gas," which was reviewed in the "JOURNAL" for Oct. 1 last. As in the case of gas, so with respect to electricity supply has legislation since the last edition effected important and far-reaching changes in the law relating to this great public utility. With regard to gas, the Gas Regulation Act, with simplifying procedure, substituting Special Orders for Provisional Orders, and transferring a great deal of what was formerly Private Bill work to the jurisdiction of the Board of Trade, has preserved in its essentials the structure upon which gas supply rests. The legislation with respect to electricity supply, however, as embodied in the Electricity (Supply) Acts of 1919 and 1922, has attempted to revise the basis upon which electricity supply rests. This being the case, and before we refer in any detail to these Acts, we think it will be unnecessary for us to emphasize the importance of the change, the necessity for a new volume of Will on "Electricity," and the utility of the book now reviewed.

The Electricity (Supply) Act of 1919 has transferred jurisdiction with respect to electricity to the Ministry of Transport, who, in effect, exercise jurisdiction through five Electricity Commissioners under the chairmanship of Sir John Snell, and to inspectors who were attached formerly to the Board of Trade. Instead of ordinary powers of supply being obtained by Provisional Order, they may now be secured (as are powers to supply gas) by the more simple method of a Special Order.

The question—important to consumers—of revision of price has been amended by section 22 of the Electricity (Supply) Act of 1922, which facilitates revision of maximum prices and also the putting into operation of tariff systems or methods of charge. No approach, however, has been made to any scheme similar to the sliding-scale, and no direct financial reward for reduced prices is given to electricity undertakers.

The main, and what may be termed the central, feature of the new Electricity Acts is that power is vested in the Electricity Commissioners to delimit large areas for unified control of electricity supply, to set up joint electricity authorities for the purpose of exercising this control, and to prevent the extension of existing, or the opening of new, generating stations. The provisions of the Acts with respect to this matter, which is of profound public importance, and particularly interesting to gas engineers, are explained most excellently by Mr. Dalton.

One feels that the course which proceedings under these Acts have taken, and Mr. Dalton's information thereon, ought to be familiar to every gas engineer. They afford an interesting commentary on the comparative value of idealistic legislation on a highly technical matter, and furnish an object-lesson as to the probable tendency of future legislative efforts to apply unification or nationalization to the gas industry. For this reason alone, we think it is well worth while that gas engineers should make themselves acquainted with the legislative condition of their sister industry electricity; and Mr. Dalton's volume, being the latest edition of the standard work on the subject, should, one ventures to say, be on the bookshelf of every gas engineer's office.

A comment may be made on the notes to the Electricity (Supply) Act of 1919, that the reason for the admittedly comparative failure of the really earnest and distinguished efforts of Sir John Snell and his colleagues to carry the Act into effect is that they do not possess sufficient compulsory powers. It is true that they cannot, in unifying a district, compel generating authorities to part with their powers to a joint electricity authority (in other words, there is no compulsory expropriation of interests), but probably the real reason is that the policy of unification rests on an assumption which is not fundamentally sound. Large generating stations do not necessarily reduce the cost to the consumer; if they did, it is certain that the various authorities would combine voluntarily in their own interests. One cannot help contrasting the happier state of matters in the gas world, whereunder schemes for the expropriation of smaller or uneconomical gas undertakings are constantly being sanctioned by the Board of Trade under the Gas Regulation Act, not, indeed, at the bidding or compulsion of any Commissioners, but at the voluntary suggestion of gas undertakers themselves.

The volume relates to the Electricity Supply Acts, Power Acts, Joint Electricity Authorities, and Electricity Supply in London, and contains much useful information by way of instructions on matters of procedure in connection with applications for Special Orders, &c. A host of other Acts which indirectly affect electricity undertakings are set out and explained, while the various regulations in connection with the control of electricity undertakers are also printed with the necessary explanations. Part II. of the book deals with the law relating to electric traction, and includes the rules and regulations thereunder.

The law as interpreted by the Courts has been noted carefully, and brought up to date, and the book is provided with the usual table of statutes, table of cases, and an excellent and complete index. Finally, a useful feature is an introduction summarizing the subject-matter of the book, and divided into six convenient chapters.

* "The Law relating to Electric Lighting, Power, and Traction," by His Honour the late Judge Shiress Will, Fifth Edition, by John C. Dalton, A.M.I.E.E., of Gray's Inn, Barrister-at-Law. London: Messrs. Butterworth & Co.; 1925. Price, 42s. net.

"TURBINE" FURNACE TESTS.

[From a Correspondent.]

In connection with the utilization for steam generation of inferior fuels in general, the "Turbine" forced draught steam jet furnace is, of course, familiar to the readers of the "JOURNAL," especially in connection with coke breeze.

There have just been made available the results of an interesting series of tests that have been carried out with the "Turbine" furnace at the Ganges Jute Mill, Seebpore, near Calcutta, under the superintendence of the Chief Engineer (Mr. J. D. Campbell), for the burning of difficult Indian coals. These are Alkusa slack, 10,000 B Th.U. per lb., Alkusa steam coal, 12,000 B.Th.U., new Tetruria coal, 8000 to 9000 B.Th.U., and Damaguria slack, 12,000 B.Th.U., all of which possess a high ash content, friability, and, particularly objectionable, a great variation in the quality. For these tests a standard 30 ft. by 8 ft. Lancashire boiler was fitted with the "Turbine" furnace, and a detailed series of trials run alongside a similar boiler on normal condition of natural draught. The greatest care was taken to ensure similar conditions as regards steam output, both boilers supplying one engine only; while all the water evaporated was weighed in tanks, so that there was no possibility of mistakes in this direction.

It was found that the saving obtained by the use of the "Turbine" furnace was between 25 and 45 p.ct. of the coal bill, depending upon the fuel and the conditions; and so highly satisfactory are the results than an order has now been placed for all the boilers in the mill—seventeen in number—to be equipped. Apart from economy, there proved to be several other practical advantages in the use of forced draught on these lines, one of the most important being the rapidity with which steam can be raised again after cleaning-out, because of the flexibility of the powerful forced draught, incidentally taking not more than about 3 p.ct. of the steam production of the plant—very little in excess of mechanical draught. The property of quick combustion of a green fire is particularly important in a tropical country like India (where the firemen are apt to become exhausted in dealing with high ash-content fuels), and is also valuable for coke breeze.

Coke Oven Plant for Alfreton.—The Blackwell Colliery Company, Ltd., of Alfreton, have placed with the Koppers Coke Oven Company, Ltd., a contract for the erection of a coal washing and bye-product coke-oven plant. The installation is to comprise a coal washery designed on the Hunter-Baum principle, having a capacity of 75 tons an hour, with storage and drainage bunkers of 2000 tons capacity, and a battery of 40 regenerative ovens designed on the contractors' latest taper principle, complete with coal and coke handling arrangements, and residual recovery plant, for the production of tar and crude benzole, and for the manufacture of sulphate of ammonia. The coke handling arrangement is designed in accordance with their American practice, and comprises a coke car driven by an electric locomotive, a central quenching station, and a mechanical loading and screening plant. The cost of the complete installation, including railway sidings, steam boilers, &c., will be upwards of £200,000. While the Company have erected a small trial battery of their new taper ovens at the Tinsley Park Colliery, which has been in operation some twelve months, and proved remarkably successful, and have under construction a similar trial battery of ovens at the Dinnington Main Colliery, the Blackwell contract is the first large installation of taper ovens to be erected in this country. Ovens of this type have, however, been largely adopted on the Continent.

CHEMICAL TOPICS FROM CURRENT LITERATURE.

Notes from Recent Technical Publications.

By H. J. HAILSTONE, A.M.I.Chem.E.

STEAM RAISING AND ECONOMY.

In an article appearing in "Chemistry and Industry," C. F. Wade indicates the basis upon which fuels should be selected for raising steam most economically. While the calorific value of the fuel is of first importance, other factors should be considered; and of these, ash and hydrogen contents are dealt with. A useful empirical formula for calculating the hydrogen content is quoted; and from this the loss consequent on the uncondensed moisture resulting from its combustion can be computed. Various other factors influencing the practical value of fuels receive full consideration.

In the same periodical, C. F. Holmboe gives several useful points regarding economy in steam consumption. He describes a method to be adopted where steam is used for heating, distillation, &c., in which cases a nozzle of suitable size is interposed in the steam supply, so that excessive consumption cannot occur. Data are given for working out the dimensions necessary. In an actual case quoted it was found that the adoption of such a system resulted in a saving of 50 p.ct. of the steam previously used for the same work.

HEATING BY MOLTEN METALS.

"Brennstoff-Chemie" gives an account of a new cracking process, by Dr. Blumner, for obtaining high yields of benzene from heavy oils without the occurrence of coking to any marked extent. The heating is performed in an autoclave containing molten lead at a temperature of about 500° C. This is a further application of a bath of molten metal for heating; such systems being adopted in several recently-developed processes where quick heating is required or where little carbonizing effect is desired. Notable among these are the "Caracristi" process of low-temperature carbonization of coal, installed at one of the Ford plants, and the "T.I.C." system of tar dehydration, now in the hands of the Woodall-Duckham Vertical Retort and Oven Construction Company (1920), Ltd.

GAS SCRUBBING TOWERS.

In order to study the efficiency of various packings in gas scrubbers, an experimental tower was built; and particulars of its operation are given by H. Drane in the Transactions of the Society of Chemical Industry. A mixture of carbon dioxide and air were passed up the tower, and washed by a stream of water descending through suitable packing. Variations of mixtures and rates of flow were under complete control; and when equilibrium was obtained at a given temperature, samples of gas and of liquid were withdrawn for analysis from different parts of the tower. From the data obtained, the "dissolution coefficient" was calculated, and found to increase with increased rate of gas flow, though to be hardly influenced by increased liquor flow. A method is described for working-out dimensions for suitable scrubbing towers to meet desired requirements.

GAS SAMPLING.

Particulars of an apparatus for continuous gas sampling at constant pressure are given by H. J. Dobson in the Journal of the Chemical Society. The collecting vessel, an aspirator, is connected at top and bottom with a vertical limb having a sealed water inlet at the top and a restricted outlet at the bottom. By an adjustable tube the collection pressure may be made higher or lower than atmospheric, as desired; and when in operation very slight variation should occur.

GAS ANALYSIS.

In the Transactions of the Chemical Society, L. Reeve gives an account of a method used for analyzing minute volumes of gas containing carbon monoxide and dioxide, hydrogen, oxygen, &c. This method, though primarily employed in another industry, will find application in special cases in gas-works routine where only small volumes of gas are available. The sample is measured in a jacketted graduated capillary tube in which three small bulbs are blown. By means of a syphon tube and levelling vessel containing mercury, the use of stopcocks is avoided. Carbon dioxide is absorbed by the introduction of a tiny pellet of caustic potash to the bubble of gas in a small collecting tube. For oxygen determination the use of phosphorus is recommended, while carbon monoxide and hydrogen are estimated by explosion with oxygen, under stated conditions, in the special top bulb. No platinum electrodes are necessary for igniting the explosive mixtures, as the two bounding surfaces of mercury can be employed by connecting the terminals of the sparking coil to the mercury vessels at both ends of the apparatus. Several special details for the guidance of manipulators are given, and suggestions made for estimating hydrocarbons, &c. With this apparatus it is claimed that an accuracy of within 0·5 p.ct. is obtainable when using so small a volume as $\frac{1}{10}$ c.c. of gas.

The use of cuprous sulphate in sulphuric acid as a carbon-monoxide absorbent was referred to in these columns recently (see "JOURNAL" for Sept. 17, p. 876), and a further interesting note is given in "Comptes Rendus," by Lebeau and Bedel, who find that the addition of β-naphthol to the solution considerably improves the reagent. It may then be used in the presence of mercury for absorbing carbon monoxide and ethylene.

L. H. Milligan in "Industrial and Engineering Chemistry" describes a type of gas washing bottle designed for efficient absorption. It consists of a cylinder with a glass stopper having inlet and outlet tubes. Inside the cylinder is placed another tube having a spiral corrugation running round it; and when gas is passed into the bottle, it ascends the spiral channel in bubbles, carrying with it plugs of liquid. On reaching the top of the tube, the washed gas travels on, and the liquid is recirculated. Experience with an easily-constructed apparatus designed by the writer of these notes, and working on the same principle, indicates that bottles of this "spiral" type may be relied upon to give efficient working.

SPECIFIC GRAVITY OF MATERIALS.

In a report of a meeting of the Ceramic Society appears an account of a paper by W. Hugill and W. J. Rees. This describes an apparatus for the determination of the specific gravity of powders, such as crushed bricks, &c., which, it appears, might also be usefully employed in the examination of coals or cokes. The apparatus consists of a conical flask having a long graduated neck. At the lower portion of this neck a bulb is blown. In operation, 250 c.c. of xylene or similar fluid is poured into the flask, thus filling it to a graduation below the bulb. Then 100 grammes of the dry powdered material is added, and after all air-bubbles have been removed, the required specific gravity figure is read-off direct from the graduations.

DISTILLATION.

Work on the thermometry concerned in distillation tests has been conducted by Dr. Ormandy and Mr. Craven; and an account appears in the Journal of the Institute of Petroleum Technologists. Lack of uniformity of tests of identical material is often due to the use of different thermometers having various periods of lag. The nature of the lag is found to vary according to the size of the thermometer, its type and position, to the nature of the liquid under test, and to the shape of the distillation flask. Where it is particularly desired to reduce the effect of lag, the use of electrical thermometric instruments is advised.

VISCOSITY.

A study of the relationship between viscosity and temperature of syrupy liquids (condensation products) has appeared in the Transactions of the Society of Chemical Industry, in which A. Drummond describes a simple method which might find application in the study of tars, and particularly in their works control. A microscopic slide of correct temperature is immersed to a definite depth in a bath of the substance under test. It is then carefully withdrawn and allowed to drain for a given time before weighing. The weight of material retained by the slide gives a measure of its viscosity. The relation between viscosity and temperature for certain oils has been found to give a straight line when plotted on a logarithmic basis; and a full discussion of this matter is given, together with references to other investigations.

INDUSTRIAL CRYSTALLIZATION.

H. Griffiths, at a recent meeting of the Institution of Chemical Engineers, dealt with factors governing the production of crystals of various sizes under different conditions, and their bearing on practical crystallization problems. The rate at which crystals develop is affected by the degree of saturation of the liquor and the nature of the process employed, while another important factor is the presence of a sufficient quantity of "seeding crystals." Each of these points was given full consideration. Information given regarding crystals of various products of special size or grade preferred by buyers applies particularly to the sulphate of ammonia market; and plant for controlling crystallizing operations to meet such requirements was described, and the physical principles were discussed. A further extension of this field of study towards solving the question of the direct formation of none but large crystals in the saturator would be of decided value to producers, and mark a real advance in sulphate-making practice.

TECHNICAL RECORDS.

An interesting event took place early in September, when about 80 men and women interested in the collection and distribution of technical information met at the first Conference of Special Libraries and Information Bureaux, to consider methods for dealing with the classification of documentary material, research work, technical periodicals, &c. A number of papers, given by experts in different branches of the subject, were keenly discussed by numerous agencies concerned with this work; and it is certain that the outcome of this conference will be beneficial in bringing forward definite schemes for the classification of technical literature and information. In the gas industry a large amount of research is always in progress, and much of the work necessitates frequent exploration in the archives of the Technical Press, in text-books, and in scientific and commercial journals. A considerable amount of such material is usually available to investigators on a large works, either in the works' technical library or in the municipal library of the large town. Such facilities are not usually fully available to the staffs of the smaller works,

usually at some distance from a large industrial centre, unless a sum is set apart for providing matter of this kind. One wonders if the provision of a reference and loan library might be worthy of the consideration of the gas industry. Now that candidates for the Diploma are required to prepare theses, such provision could certainly be put to good use.

MAINTENANCE OF APPARATUS ON THE DISTRICT.

By W. R. MOGER, of the Tottenham District Light, Heat, and Power Company.

[A Paper read before the London and Southern District Junior Gas Association on Dec. 19.]

The maintenance of apparatus on the district is a subject which has been receiving considerable attention, due to the insistent and growing demand by consumers for practical attention to be given to appliances fixed on their premises. Opinions may vary as to the best system to adopt, and the methods by which charges should be made; but it is universally accepted that regular inspection should be given. Consumers soon realize that they are receiving special attention, and the company are assured that appliances are in a good condition. Unfortunately there is quite a large number of consumers who have dispensed with apparatus because they were unable to give the attention needed, and would not trouble to find out where that attention could be obtained.

To assist in making this department a success, it is essential that the appliances introduced by the sales side should be of such quality that the particulars of efficiency supplied to the consumer can be substantiated in practice. The department responsible should see that whatever specification is supplied must be strictly adhered to. The same principle should apply to the apparatus which has passed through the company's workshops—even more so, indeed, for the consumer knows the apparatus has not come direct from the manufacturer, and consequently any little defect is greatly magnified, although a slight adjustment or repair may be all that is necessary. The majority of appliances fixed for domestic purposes are supplied by the local undertaking, chiefly on hire terms. By standardizing those parts which are subjected to excessive wear, considerable economy can be effected.

The personal element in maintenance work is another factor which counts for success. It is often the deciding-point as to whether the apparatus is to remain or to be brought away. It is necessary that the fitter should be courteous and clean in the carrying out of his duties. His training should be in a practical form, and every opportunity be given to him to see, and obtain full information relative to, the internal construction and the proper adjusting conveniences of every appliance fixed on the district. His calls should be recorded, and if possible the fittings used and time expended on the job. It would no doubt be of considerable advantage for an inspector to be able to find out, in a few minutes, what had been done to an appliance before calling on a consumer who was renewing a complaint about apparatus which had recently received attention. The number of men required for this work would depend entirely on the number of appliances on the district.

It is an unwise policy to allow a consumer sufficient time to repeat his complaint before attention is received. In the event of the complaint being in the nature of an escape or insufficient supply of gas, it should have attention the same day; but attention to apparatus could be left for two or three days, though it should not be left for more than four days. It is due to this lack of attention that consumers are often induced to find other means of meeting their requirements. Some companies are realizing the importance of this, and are engaging a special staff to deal with it. A systematic inspection of the whole of the apparatus fitted in a particular section of their area of supply is being made, with excellent results. There is no doubt that the unfortunate incidents which appear in the daily papers from time to time, through defective fittings, will be reduced in these districts to a minimum—if not entirely eliminated.

Advances in the development of appliances have been made to such a degree as to allow of very accurate adjustments being effected. Take the case of the inverted burner fitted with a superheater and adjusting nipple. Adjustments can be made on the district almost to attain the results obtained during laboratory tests. With the advent of this burner and the distance control, we have a useful weapon to use against our competitors for both interior and exterior lighting. I find the best results are obtained, when adjusting these burners during the day, by opening the air adjuster to the greatest capacity, adjusting the gas supply to obtain the maximum efficiency, and then still further reducing the gas supply until a falling-off of the light is discerned. By so doing, the possibility of carbon accumulating is avoided. Free maintenance, with charges for material only, gives greater opportunities of obtaining control of the lighting appliances on a district.

Domestic appliances also demand the same attention. This is a field which opens up great possibilities for future increases in gas sales. It is realized in many ways that the tendency of all classes is to obtain, so far as their means will permit, improved methods for decreasing domestic labour. In gas cookers, water heaters, fires, &c., the gas industry holds an exceptional advantage; but this advantage cannot be retained if the matter is not given due consideration. All apparatus coming under this category should receive the attention of a maintenance fitter at least once during the year. Evidence is always forthcoming to justify any difference which may exist between the actual cost of the work and the amount allowed when hiring rates are fixed; less changing and disconnecting of apparatus being assured, with a considerable reduction in the number of complaints received when other classes of work are demanding attention.

Discussion.

The PRESIDENT (Mr. W. Newton Booth, of Woolwich Arsenal) remarked that Mr. Moger had brought forward a subject which was of great importance to the gas industry. It was very largely the maintenance people who got into close touch with consumers; they were really the representatives of the gas undertaking so far as domestic consumers were concerned. Therefore the demeanour, courtesy, and behaviour generally of the maintenance men affected the industry to an extent which was often insufficiently realized—certainly by the men themselves. How could one persuade the consumer that gas was a clean thing if the fitter left his odd materials lying about the house? Quite apart from this, it was necessary that apparatus installed should be such as to uphold the reputation of gas. Anyone who studied the subject carefully would come to the conclusion that, for most domestic purposes, and with the current rates of supply for gas, electricity, and oil, gas had a sufficient margin of price, at the efficiencies they could guarantee, to allow for the expenditure of a greater outlay than was incurred at present in seeing that the service which apparatus gave was the best that it was capable of giving. The only thing he saw against this sort of procedure was that, so far as the industrial uses of gas were concerned, where it was possible to obtain very large increases in consumption, this could only be secured by reducing the cost of the fuel to a competitive figure. There should therefore be some way of differentiating between the prices charged for gas, or at any rate for service, to domestic consumers who were causing considerable expense in this way and to industrial users.

Mr. SAMUEL B. CHANDLER (Tottenham), who wrote regretting his inability to be present at the meeting, particularly as a paper was to be read by one of his staff, forwarded the following contribution to the discussion: The subject opened up by the author is an important one, and forcibly reminds us of the growing need for full and efficient service to the consumer. Until such time as we are able to apply in practice the principle of "all-round" maintenance to each gas user, it cannot be said that the industry is undertaking requirements which, in the light of modern conditions, are necessary to make certain that every consumer of gas is completely satisfied with his apparatus and general conditions of usage. The proper organization of an "all-round" maintenance department, comprising foreman, attendants, and clerical staff, is not a difficult matter, and it should be quite possible to run this service at a very reasonable cost—particularly when one assumes that "complaints" could, without doubt, be very largely reduced, and consequently money be saved in this direction. Service such as that indicated, giving at least four calls per consumer per annum, should be quite possible with an expenditure in the neighbourhood of 0·2d. to 0·3d. per therm, this including free service to the consumer where undertakings' appliances are concerned—a charge being made for replacements of all own lighting and other apparatus. It is particularly important that the industry should carefully consider this matter, in face of the opinions recently expressed in Parliament by the Board of Trade that it was not proposed to put into operation legislation to secure inspection of gas installations; the view taken by the Board of Trade being that the gas industry is quite competent to, and will assuredly, see to it that work of this character is not neglected. In the selection of the staff, particular attention is necessary in order that the right type of man is employed, and preliminary training in the workshops of the undertaking should form part of the scheme, at the termination of which oral, theoretical, and practical tests should be applied. The opportunity afforded to these men by their "right of entry" into consumers' houses would thus be taken full advantage of, and no opportunity be lost in making suggestions and recommendations as to the alteration or installation of gas-consuming appliances—the attention of the inspector being drawn to cases where the matter is of rather too technical a nature to be dealt with by the maintenance attendants. Information would, of course, be given to the men at periodical meetings held by officials of the undertaking for this particular purpose. I feel sure the demand for this service is urgent, and that the industry generally will be well advised to put it wholly into practice.

Mr. W. L. WESTBROOK (North Middlesex Gas Company) said there was one very desirable thing, which he believed most people practised—namely, that after apparatus had been fitted it should be inspected right away, and adjusted in order to give the very best results at starting. Afterwards it should be maintained at this pitch of efficiency, if possible. There was another aspect of the maintenance question which was of vital importance, and this affected their friends on the works. One could not get the best results unless the gas was of constant pressure, composition, and calorific value. It was, no doubt, a very big thing to ask for, but he did feel that no maintenance scheme could be a complete success unless they approached as near as possible this ideal. When men got into a house they should be capable of making all adjustments of apparatus which might be required there. It should not be necessary to send another man along to do anything. He would therefore have to be a man of some training. In fact, the best type of fitter was required for such a job. The alternative was to train special men for the adjusting of apparatus, and then any difficulty that might be met with had to be put in the hands of a fitter, who followed them up. Consideration must be given to the cost of the work. An efficient maintenance scheme was going to cost a good deal of money; and if they asked the consumer to pay it, the scheme would not become general over the district. He did not think they could ask people to pay for the labour; if they did, consumers would not go in for the scheme to any great extent. The labour should be

included in the cost of gas, so that all consumers might allow the men to enter their houses and inspect the apparatus.

Mr. MOGER said one could not fairly relegate hot water work to the maintenance fitter. He would advocate specially trained men for circulators, &c. To attend to a circulator properly it should be taken to pieces, and one man could not do this. It could be regarded as seasonal work, to be done in the spring. He did not agree that the cost of maintenance should be put on the gas; it should be allowed for when the rental of the apparatus was being arranged. Anyhow they could not charge the consumer directly; it must be done in some indirect way.

Mr. WESTBROOK: Would you include geysers in your general overhaul?

Mr. MOGER: Yes, geysers especially.

Mr. H. W. KERRIDGE (Croydon) remarked that they would be up against the human element all the time. At Croydon they did all they could to encourage the men to be clean. They gave them facilities in the way of overalls, and their kits were regularly inspected. So far as possible they pursued the policy of interchange of fitters. The maintenance men also took their share in periodical meter reading, and in getting new business. It was suprising to find how much new business was obtained by maintenance men.

A MEMBER pointed out that, in connection with cookers, one would have to draw the line between strict maintenance and cleaning. There was always a difficulty in this direction. The maintenance of a cooker was a service which could be easily rendered perhaps once a year, or twice would be ample; but cleaning was a different matter altogether, and would have to be dealt with apart. As to fires, they should be inspected at least once a year, at the beginning of the winter season. Circulators were quite a problem in themselves; it needed a specially experienced man to handle hot water apparatus. Gas undertakings should, however, undertake this work.

Mr. D. J. WINSLOW (Lea Bridge District Gas Company) took it that the real question was as to who should bear the cost of maintenance. As speakers had already said, fires should be done annually, but how many companies now systematically examined their fires once a year? The money had to be found somehow, and the rent of the fire should cover this. As to cookers, was it suggested that they should include the cost of maintenance in the rental? Three-fourths of the complaints regarding cookers were due to dirt, &c., and it would be unfair to put the charge for attention on the rental of cookers, for the benefit of the dirty consumers. One person would have a cooker for ten years without needing attention, while another would not go ten weeks. All burners should be on maintenance. One of the objects of maintenance was to ensure that no gas apparatus should come out of a house through neglect. Before apparatus was removed on request, did the author advocate inquiry being made as to why it was no longer required? If at all possible, all complaints should be attended to on the day of receipt; if this was not practicable, more men should be engaged on the work. Gas companies should welcome complaints. ["Hear, hear."] They should advertise that they wanted people to let them know if apparatus was not giving satisfaction, so that it might be attended to at once.

Mr. MOGER remarked that to attend to all complaints on the day of receipt would need a very big staff. Escapes and clearing of services must, of course, be attended to immediately. With regular maintenance, he was of opinion that complaints would be reduced to a minimum. Instead of encouraging complaints, he said "Remove the cause."

Mr. A. BROADBENT (Gas Light and Coke Company) said the author had brought well home to them that maintenance of all apparatus on consumers' premises was essential; and he was only sorry that Mr. Moger could not give them some indication of the cost and time occupied. Every outside man wished to see a system of maintenance generally adopted, as the best means of ensuring continued expansion of their business such as was taking place at the present time.

Mr. MOGER said that in his case, when a request came through for apparatus to be removed from premises, the consumer was called upon to ascertain the reason; but unfortunately it was occasionally found that the apparatus had already been disconnected, and this would have been avoided had the apparatus previously received proper attention.

Mr. W. T. KENSHOLE (Lea Bridge District Gas Company) thought they were all agreed that some system of maintenance was desirable. After all, what a fine advertisement it would be for all their fires and cookers to be always at the highest point of efficiency. The maintenance method to be adopted was, however, largely governed by the nature of the district concerned. It seemed to him that by maintenance they stood to gain three things. In the first place, the satisfaction of the consumers; secondly, extended use of the apparatus, and consequent increased gas consumption; and, thirdly, "business getting" by the maintenance men.

Mr. F. HOLLAND (North Middlesex Gas Company) asked how many companies maintained slot fittings in the same way that they did those of the quarterly consumers.

Mr. BROADBENT said that the Company he had the honour to serve had inspected and gone over thoroughly not less than 200,000 automatic supplies—fittings and everything else.

Mr. MOGER added that, in his case also, every month a large number of slot consumers' fittings were overhauled. They were not leaving the prepayment meter users to carry on in the good old way. They put in special burners, and maintained them if desired.

Mr. J. HEWETT (South Metropolitan Gas Company) thought the whole question of maintenance was a difficult one; but the cooker was the hardest thing to deal with. If they used the word "maintenance," and included cookers, people would not only want the cooker maintained, but probably they would feel that some responsibility rested on the company to keep the thing in going order—which meant keeping it clean. The whole point about cookers seemed to bear on the fact that the consumer would not be educated to use the cooker in the way in which it should be used. In dealing with maintenance, the question of including cookers would require a lot of consideration.

The author was heartily thanked by the members for his contribution.

CARBONIZING A SOUTH WALES GAS COAL IN VERTICAL RETORTS.

A Fuel Research Board Technical Paper.

A little more than a year ago there was issued by the Fuel Research Board of the Department of Scientific and Industrial Research an account of some experiments made on the effect of steaming Wigan Arley coal in vertical retorts, and this has now been followed by Technical Paper No. 10, which deals with the carbonization of a South Wales gas coal in continuous verticals, with the introduction of varying amounts of steam into the retorts.* The coal selected for the purpose of the investigation was a mixture of Pentre and No. 3 Rhondda Seams, from the Meiros Collieries, Llanharan, and special tests of six to eight hours' duration were devised for the measurement of the yield of gas under conditions in which no steam was introduced. It is explained that in the experimental setting of retorts at the Fuel Research Station it is not possible to continue carbonization over long periods without the introduction of steam, owing to the bottom castings becoming over-heated—hence the need for devising special tests, as the Colliery Company were anxious to have results of the carbonization of the coal without steaming.

One of the main lines of inquiry being carried out by the Fuel Research Board is concerned with the physical and chemical survey of the national coal resources, and this involves the determination of the suitability for various purposes of the seams investigated. From this point of view, large-scale tests of suitably selected coals will be undertaken from time to time. The first of these investigations of special coals was that on the Arley seam from the Lancashire coalfield, to which reference has already been made. This was followed by a similar investigation on Holmside Durham coal, at the request of the South Metropolitan Gas Company, who bore part of the cost; and a report of this is being prepared for publication. It is pointed out that a special feature of the latter investigation lies in the comparison of the results obtained in inclined intermittent retorts with those in vertical continuous retorts.

Coming to the Technical Paper now under review, though no systematic survey of the seams has yet been started in South Wales, it was thought that large-scale tests on a typical South Wales gas coal would be of value. This coalfield is not specially rich in seams suitable for gas making in vertical retorts, and Mr. H. D. Madden (Chief Engineer of the Cardiff Gas Company) was consulted with regard to the selection of a coal for the tests. He suggested as a good choice that supplied by the Meiros Collieries. The coal supplied was the average unscreened products of the colliery, and consisted of approximately 60 p.ct. Pentre seam and 40 p.ct. No. 3 Rhondda seam. These seams belong to the subdivision of the South Wales coal measures which includes the principal seams of the coalfield; and in that part of Glamorganshire in which the Meiros Colliery is situated the seams of this series are bituminous, and are a valuable source of gas and house coals.

The carbonization tests were carried out on uniform consignments of coal in the station setting of four continuous Glover-West vertical retorts. Three full-scale tests were carried out, each on 50 tons of coal and lasting 120 hours, using 5, 12·5, and 20 p.ct. of steam respectively—and, of course, there were also the runs without steaming. The methods employed in conducting the steaming tests were identical with those set-out in the report of the Fuel Research Board for 1920-21, First Section. The results of the tests without steaming were: Throughput, 2·5 tons per retort per day. Yield of gas: 5000 c.ft. per hour, or 12,000 c.ft. per ton of coal, or 65 therms per ton.

The general effect of steaming on the yields of products may be summarized as follows, for increases from 5 to 20 p.ct. of steam:

Steam	5 P.Ct.	20 P.Ct.	Increase.	
			Actual.	P.Ct.
Gas, c.ft. per ton	15,070	19,210	4140	27·5
Gas, B.Th.U. per c.ft.	493	458	−35	−7·1
Gas, therms per ton	74·3	88·0	13·7	18·4
Tar, gallons per ton	9·22	11·78	2·56	27·8
Ammonium sulphate, lbs. per ton	21·30	23·55	2¼25	10·6

The above results, the report states, are quite normal for a medium gas coal. The tar yield at 5 p.ct. steam is somewhat low, but an appreciable increase is obtained with higher percentages of steam. The increase of ammonium sulphate is negligible after 12·5 p.ct. steam, owing to the high temperatures prevailing towards the top of the retorts—an effect of steaming which has been observed before with coals containing a low percentage of moisture, such as the Durham gas coals.

The increase in the gas yields from no steam to 20 p.ct. steam, as determined in the special runs, was 7210 c.ft., or 23 therms, as

* Fuel Research Board Technical Paper No. 10, on the Carbonization of a South Wales Gas Coal in Continuous Vertical Retorts. Published by H.M. Stationery Office, Adastral House, Kingsway, W.C. 2 (and Branches). Price 1s. net, postage extra.

compared with 4140 c.ft. and 13·7 therms shown above for increases from 5 to 20 p.ct. of steam. The comparison at different stages is shown in the subjoined table:

Gas Yield without Steam, 12,000 C.Ft. Per Ton, or 65 Therms.

Steam to Retorts (P.Ct. of Coal Charged).		Increase of Gas Yield over that obtained Without Steam.			
Total Added.	Amount Decomposed.	C.Ft.	P.Ct.	Therms.	P.Ct.
5·05	5·05	3070	25·6	9·3	14·3
12·60	7·60	5660	47·2	17·5	26·9
20·07	9·68	7210	60·1	23·0	35·4

The coke obtained was particularly noticeable for its bright silvery lustre, only a very small proportion being dull. It formed fairly large lumps which, though hard, had a somewhat open structure. The amount of breeze was normal.

AMERICAN GAS ASSOCIATION.

Review of Reports and Papers.

[SIXTH ARTICLE.]

Oxygen in Gas.

One of a number of Sub-Committees of the Chemical Committee had to investigate the question of the disappearance of oxygen from town gas, while flowing from the manufacturing station through the mains and services to remotely situated consumers. The Sub-Committee realize that an important point would be gained were it possible to establish a relationship between the disappearance of oxygen and troubles caused by the accumulation of rust deposits or by oxidized gummy deposits in the distribution system; but so far the results have been negative, because this action involves very small differences, and does not confirm what theoretically is to be expected. It appears that, under somewhat favourable conditions, when a single plant was distributing gas to the whole Boston district, comparisons were made between the oxygen tests of the gas at the works outlet and at a point 18 miles away, and they were found practically alike. The works outlet varied from 0·30 to 0·45 p.ct. of oxygen, and at the distant point from 0·25 to 0·40 p.ct. The average difference was 1·20th p.ct. loss of oxygen; but owing to conditions of testing, this figure is not considered reliable.

The Sub-Committee say that it is impossible to specify the amount of oxygen to be admitted to the purifiers, for that is determined by the necessities of the case, and should be as low as possible. If all the oxygen acted, 2¼ p.ct. of air would satisfy 600 grains of H_2S in 100 c.ft.; but this action is never complete at the usual rates of flow, since the oxidizing appears to proceed more slowly than sulphiding. Where liquid purification is carried on successfully, no air need be admitted to the boxes—or, if air is admitted, it should be immediately before the dry purifiers—since it would tend to convert the soda into useless compounds. Further, in a coal gas plant the oxygen should not be admitted on the vacuum side of the exhauster, but should be run into the gas after the ammonia is removed. This point was emphasized in the report of the Chief Inspector of Alkali Works for 1923, which was dealt with in the "JOURNAL" last July.

The Right to Advertise.

The convention was addressed by Mr. Leonard Ormerod (Vice-President of the Public Utilities Advertising Association) on "The Right of a Public Utility to Advertise." Answering his own question, he said it seemed to him that, not only has the public utility every right to advertise, but it is under obligation to do so. The service of the public utilities is so necessary, so vital to the community, that a more direct discussion of this service with the men and women dependent on it is necessary. This is, however, by no means the whole of the argument, for there are in addition sound business reasons why a public utility undertaking should make use of advertising in order to promote a wider understanding of its service and its practices.

As to this, in the first place it is easier and more economical to deal with a favourably disposed public than with one which, through lack of understanding, is inclined to be captious or critical. Such a lack of understanding means friction, and friction is always expensive, for it generates heat and wears out the machinery—human or otherwise. In the second place, there are regulations and legislation to be considered. A wide understanding by the public is the best safeguard against any ill-considered action that might very easily result in injury to the service and a severe setback to the utility. Still a third reason for a proper programme of education is the constant necessity for most public utilities to add to their capital investment. There is only one place from which such new capital can be obtained, and that is from the investing public, which is, after all, the gas-using public. If this public has confidence in the management of its utilities, it will be willing to invest in their securities. Lacking this confidence, such industries will find it difficult, if not impossible, to obtain the necessary new capital at a reasonable rate.

Customer Ownership.

That "customer ownership"—the placing of shares and stock of an undertaking as widely as possible among the customers and employees—has done much for the public utility companies of the United States was made clear by Mr. Marten J. Insull (President of the Middle West Utilities Company), who pointed out what it has accomplished, the lines along which he considers it may be extended, and the methods by which the fullest benefits of the system may be secured. As he pointed out, utilities should realize that customer ownership taps a potential field which will supply them with a considerable part of the new money for their growth. The field must be dealt with intelligently, as it is a great reservoir of wealth which should endure. One has seen, in a single decade, the plan which in the beginning added but a pitifully few thousands of stockholders to utility companies in a year now measure its gain in the hundreds of thousands of stockholders annually. These hundreds of thousands of new customer-partners are furnishing a very necessary part of the new capital required. On an average, the percentage of the customer-partners to customers has grown in ten years from almost nothing to approximately 6 p.ct. Another decade should see utilities adding perhaps a million customer-partners annually, and their percentage to customers served mounting even higher. The goal is a partner in every customer.

The Sales Department.

That the future development of the gas industry calls for well-paid, intelligent salesmen who do more than sell, was the argument put forward by Mr. Thomas F. Kennedy, Manager of the New Business Department of Messrs. Henry L. Doherty & Co. It must, he said, be remembered that the object of a sales, or new business, department is to sell gas, thereby increasing the gross revenue, and promote the public goodwill. The results of the activities of the sales department cannot be correctly measured by the number of appliances sold. The activities of such a department should embrace much more than the important item of appliance sales, if the maximum of increased revenue is to be produced. The following major lines of endeavour should be followed by the sales department, if the gas company are to get full value from this organization: (1) To promote the sale of new and additional appliances; (2) Secure new customers from (*a*) dead gas services—*i.e.*, gas services on premises not in use; (*b*) houses on gas mains having no gas service; and (*c*) securing the maximum number of customers on gas main extensions. (3) The retention of, and increasing the gas revenues from, present customers through (*a*) placing all appliance on customers' premises in good order; (*b*) by taking-up and following to successful completion customers' complaints of faulty service and appliances, high bills, &c. (4) The analyzing of the minimum-bill customers for reasons for not using more gas, and correcting the cause, if possible. (5) To carry to the customer the company policies, correct misunderstandings, and earn goodwill and favourable publicity on the part of every customer and the public towards the company. (6) To sell coke and securities, and all other products the company has to sell.

The one supremely difficult thing in business, concluded Mr. Kennedy, is salesmanship. Goods can be manufactured on a formula; but it takes a man to sell. He who sells is a success; others may be. The man with a secret process of manufacture always imparts his secret sooner or later; but the salesman does not impart his secret, because he cannot. It is not transferable; it is a matter of personality.

Aluminium Paint as a Heat Saver.

Aluminium has, says the "Gas Age-Record," always been known as a metal with a low coefficient of heat transmission, in spite of the fact that radiators in the home are still coated with aluminium paint. As yet, the gas industry has not generally appreciated the value of the properties of aluminium as applied to heat conservation in the plant. For many years large rotary cement kilns have been covered with aluminium paint, in order to prevent heat losses. Recently a few gas plants have used this paint with good results for their water gas generator, carburettor, and superheater shells. Not only is heat saved, but the light-coloured paint brightens-up the dark places often found around such equipment, thus making for better working conditions. It would, our contemporary adds, seem that this is a very simple way to lighten and improve the appearance of equipment, as well as to save generator fuel—even if it be only a relatively small amount.

Low-Temperature Treatment of Bituminous Materials.—A discussion on this subject is to be initiated by Mr. T. W. Stainer Hutchins, at the Royal Society of Arts, John Street, Adelphi, on Friday, Jan. 16, at 8 p.m., in connection with a joint meeting of the London Section of the Society of Chemical Industry and the Chemical Engineering Group. Those intending to take part in the discussion include Dr. C. H. Lander, Director of Fuel Research. The chair will be taken by Mr. C. S. Garland (Chairman of the Chemical Engineering Group), who will be supported by Dr. Bernard Dyer, F.I.C. (Chairman of the London Section of the Society of Chemical Industry).

CORRESPONDENCE.

[We are not responsible for opinions expressed by Correspondents.]

Gas Engines on Hire.

SIR,—To reply to the questions by your correspondent "Progressive Senior," which appeared on p. 731 of the "JOURNAL" for Dec. 10, wherein I am asked what would be my basis and charges for gas engines on (a) hire, (b) hire purchase, and (c) sale, concerning (a) the following are my proposed terms for gas engines from 7 to 53 B.H.P.

Add 80 p.ct. to the net cost of the engine, which is made up as follows—	£
Assume capital cost of engine	100
Interest charges at 6 p.ct., quarterly payments. .	= 30
Maintenance charges at 4 p.ct. per annum . . .	= 40
Insurance, &c., at 1 p.ct. per annum	= 10
	£180

The total amount to be divided into forty quarterly payments of £4 10s. each, which means that the gas undertaking will be fully re-imbursed as regards the initial outlay on engines in ten years.

With regard to (b) and (c), I would refer your correspondent to the latter part of my Presidential Address, in which I point out that "hire purchase has assisted us in our endeavours to retain the power load, but events during the last twelve months have revealed the fact that consumers are not prepared to spend capital on new plant when electric motors can be had on hire." Therefore, it is solely the question of straight hire that I am putting forward for consideration.

My aim in bringing this important proposal—hire of gas engines—forward is to see if the serious losses in our power load through the replacement of gas engines by electric motors and crude oil engines, &c., could be stayed by offering our consumers similar terms to those offered by our competitors, which, together, with the undoubted economy that the modern gas engine ensures, would lead to the power load being retained and increased.

I have ample proof that a very large number of engines have been lost through lack of enterprise on the part of the gas industry. For instance, one large undertaking during the last fifteen years has lost about half its gas-engine consumers, due solely to the fact that the users hired electric motors instead of facing the capital expense of replacing gas engines which had been in actual use from twenty to thirty years.

The industry is in a unique position in this venture, for the two leading gas-engine makers have definitely promised to assist us with extended terms of credit, &c., which is a good safeguard. Further, we must not overlook the fundamental fact that it is futile to expect to retain or increase our business when the terms offered to the consumer are always distinctly in favour of the competitor.

If your correspondent will refer to Vol. 168, pp. 352, 630, 657, and 658, of the "JOURNAL," I think that, along with me, he will be fully convinced that to let out gas engines on hire on the lines indicated is a sound commercial proposition and will eventually become an additional part of our present hire system.

Derby, Dec. 24, 1924. HARRY CLARK.

REGISTER OF PATENTS.

Purifier Valve Mechanism.—No. 224,947.

CLAPHAM, T. A., of Keighley.

No. 20,994; Aug. 18, 1923.

In introducing his specification, the patentee says the valve, according to the invention, may be styled a combined sequence control and reversing valve which will allow reversibility in any unit independently of, or without interfering with, any other unit or units, or without interfering with the sequence working.

We are unable to reproduce the detailed drawings and the text of the specification, but point out that the main claim is for the employment of two four-way valves for each section of the purifiers, with pipe connections therewith whereby the controlling of the working of all or any of the units and the reversing of the direction of the flow through same may be carried out independently of, or without interfering with, the sequence working.

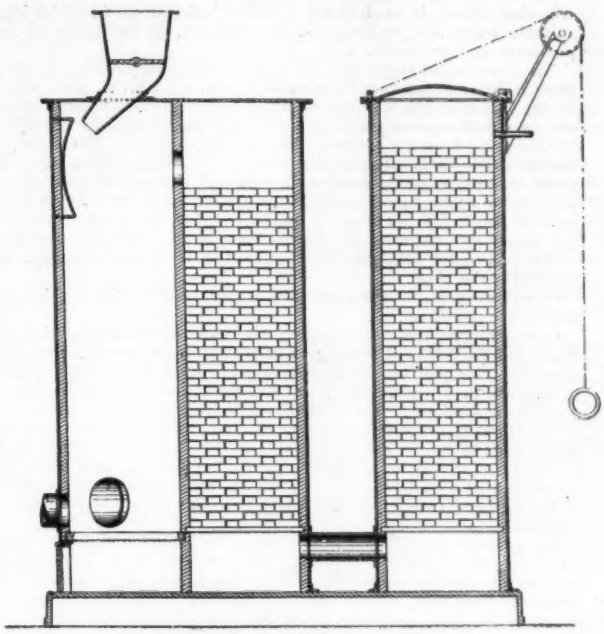
Water Gas Manufacture.—No. 224,950.

DVORKOVITZ, P., of North Kensington, N.W. 10.

No. 21,082; Aug. 20, 1923.

This invention relates to apparatus for use in the manufacture of water gas in which coke, coal, or other carbonaceous matter in a finely-divided condition is subjected to the action of heat in the presence of oxygen and hydrogen. The vessel, through which the carbonaceous matter and the oxygen and hydrogen pass downwards, is provided with a deflector against which the coke is projected by a suitable hopper so that it is dispersed. The deflector is so situated that the decomposed steam entering the vessel impinges upon the deflector and meets, at a high velocity and pressure, the carbonaceous matter. Thus the oxygen combines more readily and effectively with the carbon so that carbonic oxide is formed and mixes with the free hydrogen.

The divided coke, coal, or other carbonaceous matter may be subjected to preliminary heating to remove moisture and other volatile matter before being admitted to the vessel. The oxygen and hydrogen are admitted at, or near, the top of the vessel; the steam having been submitted to a temperature usually from 1000° to 1100° C. (but which may be from 950° to 1200° C.). The vessel, as will be seen in the diagram of the plant which we reproduce, may be divided into two vertical parts, in the first of which, by means of a blower, carbonaceous matter is heated to incandescence; the hot gases then passing through the second part of the vessel, and thence into a pre-heater. When the requisite heat is attained, the blowing will be stopped and steam be admitted in the pre-heater, so that it takes up the heat obtained from the incandescent fuel and is decomposed and then passes into the vessel, where it meets the dispersed divided fuel.



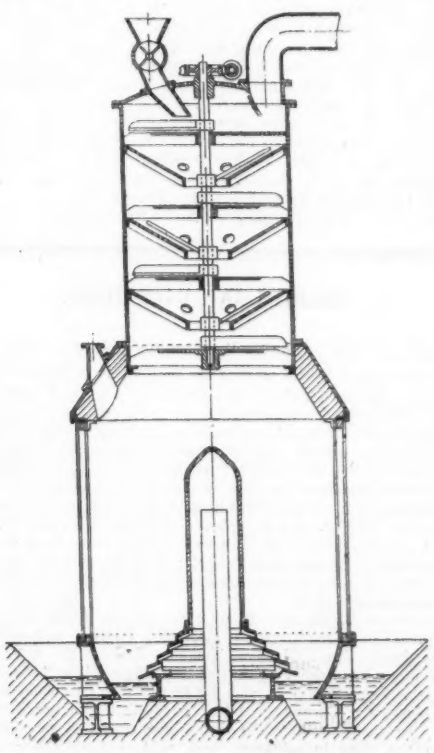
The Dvorkovitz Water Gas Producer.

Gasification of Coke Breeze.—No. 225,008.

WOLLASTON, T. R., of Manchester.

No. 24,440; Oct. 2, 1923.

This invention relates to the gasification of coke breeze, or it may be dust from coke screenings. The carrying-out of the invention involves the use of parts some of which are, in themselves, known, but which are combined and the breeze subjected to treatment therein in a particular manner—that is to say, a preheating drying and dis-



The Wollaston Gas Producer.

tributing retort is used above a water jacketed producer having a suitable water lute or bottom, and under certain conditions of temperatures and pressures.

The retort is arranged according to the invention described in specification No. 209,352 [see "JOURNAL," Vol. CLXV., p. 382], wherein the material fed into the retort is evenly distributed and opened out by movable members or ploughs, thus facilitating the passage of the hot gases from the producer through the material. The blast pipe for the producer is situated within a central dome device above the grate. The sides of the producer are unlined and provided with water jackets for cooling purposes and for generating steam, which latter may be supplied to the dome, whereby the blast may be saturated, or the steam may be used for driving auxiliary machinery. Atomized water jets may, alternatively, be injected into the blast pipe for saturating the blast.

One form of grate and water lute is clearly shown in the drawing which we reproduce.

It is arranged that the temperature of the upper part of the producer and the adjacent lower part of the retort interior is about 350° to 450° C., but 400° to 450° C. preferably, which temperature is allowed to increase to a maximum of approximately 1000° C. at the hottest zone in the producer. The tendency of the temperature to rise above a desired extent is prevented or controlled by radiation of heat from the particles of breeze to the water jacket. The saturation temperature of the blast should be approximately 68° to 70° C.; and the blast pressure approximately 4 in. to 6 in. of water, although the depth of the fuel bed in the producer determines the actual blast pressure required.

The patentee says that one of the greatest difficulties hitherto experienced with breeze has been to prevent the light dust from the upper parts of the producer being carried over with the gas. This is, with the present system, almost wholly obviated, on the one hand, by reason of the dried condition of the fuel whereby the total interstices for the passage of blast are more or less maintained constant, however the sizes of the material particles may practically vary, and a low blast pressure is permissible. On the other hand, the upper retort acts as a dust intercepter or baffle and controls the velocity of gas passing through.

APPLICATIONS FOR PATENTS.

[Extracted from the "Official Journal" for Dec. 24.]

Nos. 30,052 to 30,714.

BESTA, A. K.—"Low-temperature distillation of fuels." No. 30,606.
BINGHAM, J. H.—"Gas meters." No. 30,448.
BRETHERICK, D.—"Vertical retorts, &c." No. 30,421.
CARTY, M. W.—"Apparatus for extraction of particles from gas streams." No. 30,693.
COLE, E. S.—"Flow-measuring systems." No. 30,148.
GILL, G. M.—"Revivifying oxide of iron used in purification of gas." No. 30,617.
GLOVER & Co., LTD., G.—See Bingham, J. H. No. 30,448.
HANSFORD, J.—"Gas meters." No. 30,379.
HELPS, G.—"Gas cookers and burners." No. 30,054.
HUMPHREYS AND GLASGOW, LTD.—"Manufacture of gas." No. 30,255.
JENNINGS, W. F.—"High-speed gas compressors." No. 30,352.
OPPEN, E.—"Electric gas purifiers." No. 30,411.
PLATTE, C.—"Spigot-and-socket pipe joints." No. 30,399.
PRESTAGE, E.—See Jennings, W. F. No. 30,352.
RADIATION LTD.—"Gas heating apparatus." No. 30,482.
SMITH, E. W., and SMITH METERS, LTD.—"Lubricating stuffing-boxes of gas meters." No. 30,633.
STELFOX, J. C.—See Humphreys and Glasgow, Ltd. No. 30,255.
STURTEVANT ENGINEERING CO., LTD.—See Gill, G. M. No. 30,617.
WEST & Co., LTD., H. J.—See Jennings, W. F. No. 30,352.
WETHERED, O. S.—"Burner devices for stoves, &c." No. 30,546.
YATES, H. J.—See Radiation Ltd. No. 30,482.
ZWICKY, J.—"Oil gas generators." No. 30,620.

DIARIES AND CALENDARS.

A number of diaries and calendars for the New Year have been received from our business friends. There is a great improvement in the form of the diaries. They are compact and well and neatly bound. One is from the Stanton Iron-Works Company, Ltd. Preceding the diary is a large amount of data useful to the engineer regarding pipes, bends, &c. A combination pocket case, diary, and tabular and other matter which is required daily by engineers has been received from the Staveley Coal and Iron Company, Ltd. An interesting photographic reproduction is a page from the accounts of the Staveley Works, dated 1702. Messrs. Charles F. Stead & Co., Ltd., of the Sheepscar Tannery, Leeds, have sent a small daily memorandum and engagement book; also a waistcoat memorandum tablet. Both are beautifully bound in leather—evidently specimen productions of the firm.

As to calendars, Messrs. Brotherton & Co., Ltd., have forwarded a set of refills for 1925, with a quotation from a well-known author for each day. From Messrs. Newton, Chambers, & Co., Ltd., a wall calendar has come, with the days figured so boldly that they can be seen from any part of a large office. The Whessoe Foundry and Engineering Company, Ltd., have also forwarded one plainly figured. In this case, it is pointed out, the engagements may be noted on the slips in advance, and will automatically come into sight on required dates.

MISCELLANEOUS NEWS.

GAS REGULATION ACT APPLICATIONS.

There has appeared in the "London Gazette" the following further notice regarding applications to the Board of Trade under the Gas Regulation Act.

DECLARATION OF CALORIFIC VALUE.

Lytham St. Anne's Corporation.—525 B.Th.U. throughout the borough, in substitution for 500 B.Th.U. in the St. Anne's-on-the-Sea area and 430 B.Th.U. in the Lytham area. (April 1.)

FLOOD EFFECTS AT POOLE AND CHRISTCHURCH.

Referring to a violent gale which suddenly sprung up on the morning of Nov. 27, the "Co-Partner" Magazine of the Bournemouth Gas and Water Company says that this happened to coincide with a spring tide, with the result that the low-lying parts of Poole and Christchurch were flooded. At Poole, the tide was well over the Quay wall and above the yard level of a considerable portion of the works. At Pitwines [where the Company are erecting new gas-works], while those portions of the site that had not been made-up to datum level were flooded, the ground which had been raised to the finished level of 7 ft. above Ordnance datum was clear of the water by 6 in. This is very satisfactory, as only in very exceptional circumstances is the water likely to rise much above that reached recently. At Christchurch, heavy floods were also experienced, and the main road outside the works was under 2 ft. of water, which also covered all the surrounding fields and the works yard. The water rose so rapidly, and the waves caused by the gale were so large, as to break down the encircling earth bank round the excavations for a new 500,000 c.ft. gasholder which Messrs. Willey & Co. are erecting. The flood poured into the excavation so quickly that the bottom handholes and the apertures for the inlet and outlet pipes were unable to pass the water into the interior of the tank fast enough to ensure that the level of water inside and outside the tank were the same. Consequently the head of water outside the tank became so great that the tank, though it contained the inner lift, holder crown, and part of the outer lift—a total weight of some 300 tons—was floated off the foundations and moved a considerable distance. Fortunately no damage was done to the holder and tank, and it will be possible to allow the holder to remain in its new position, though a small addition will have to be made to one side of the reinforced concrete foundation, to afford a firm bed for the tank in its new position.

COAL-TAR PITCH POSITION.

From the "Chemical Trade Journal" for Dec. 12.

The sensational slump in prices that has been such a feature of the British coal-tar pitch market during the past ten months has occasioned much concern, both to makers and distributors of this product; and many attempts have been made to determine the exact cause of this break in the market, and to gain some idea of what future pitch price tendencies are likely to be. Unfortunately, it has not proved easy to provide a positive answer to either of the two questions postulated above; as it is recognized that quite a number of factors have been operative in effecting the dislocation of the market.

There is no doubt that, at the beginning of this year, when pitch was realizing about £3 10s. a ton, this price was largely artificial, although it must be admitted that the diminished production of coke-oven pitch in 1922 and 1923 would in any case have meant a marked stiffening of the market position. Again, the export demand during 1923 remained fairly steady, and sellers, faced with an attractive export market, could hardly have been expected to sell at much lower figures in the home market. The details of the United Kingdom export trade in coal-tar pitch during the four years 1920-1923 are given in the following table, upon which further comment is needless.

Exports of Coal-Tar Pitch from the United Kingdom.

Country of Destination.	1920.	1921.	1922.	1923.
	Tons.	Tons.	Tons.	Tons.
Sweden	1,629	106	337	258
Germany	271	165	2,780	4,087
Netherlands	41,362	2,341	33,359	20,336
Belgium	293,268	102,362	126,102	89,466
France	223,375	139,206	194,470	228,036
Tunis	..	4,070	5,790	1,503
Spain	78,218	37,248	47,058	33,406
Italy	58,204	6,121	1,227	24,046
Egypt	5,624	1,891	3,423	1,842
Other Foreign Countries	12,027	8,393	6,360	7,385
British India	1,833	1,634	2,717	2,081
Other British Possessions	750	698	1,068	1,142
	716,561	304,253	424,691	413,588

It might be mentioned, however, that, so far as the present year is concerned, exports seem to have fallen-off to a considerable extent, for in the nine months, January to September, 1924, only 217,916 tons of pitch left United Kingdom ports, its main destination being France (168,765 tons) and Belgium (41,171 tons). This reduced export demand has naturally had its effect, and is one of the factors responsible for the lower home prices to-day.

It is more than possible that the twelve months' export figures

will make a better showing than do the nine months' figures, for the present shortage in Germany is certain to attract considerable imports of the British product, and may occasion a slight hardening of the market in the near future. As a matter of fact, slight, though definite, indications in this direction are already evident, and sellers of pitch are more optimistic with regard to next season's prospects.

Examination of the import position sheds more light on the movements of the pitch market during the present year. The high prices of pitch during 1923, coupled with its shortage, compelled South Wales patent fuel makers to resort to foreign sources for supplemental supplies, and large contracts were made with American producers. The official statistics show that imports of coal-tar pitch into the United Kingdom rose from 40 tons in 1920, 568 tons in 1921, and 834 tons in 1922, to no less than 59,659 tons in 1923; and of this last figure 58,682 tons came from the United States. This importation was continued during the early months of the present year, but has now almost ceased, as a consequence of the more plentiful supplies and lower prices of the British product. Mr. H. H. Merrett (Chairman of the South Wales Patent Fuel Manufacturers' Association) has stated recently that altogether some 100,000 tons of the American pitch have been imported; and there is no doubt that here we have one of the main causes of the collapse in British pitch prices. Attempts at making patent fuel without binders, or with binders other than coal-tar pitch, have proved but partially successful, and for the present the patent fuel industry continues to offer an important outlet for coal-tar pitch. But the experience of the last year or two and the fact of it having been shown that American pitch, even if it sometimes requires a preliminary conditioning process, is a practicable alternative to the British pitch will make pitch suppliers chary of undue price rises.

Another factor which has materially influenced the pitch market during the last year has been the heavy increase in the amounts of natural asphalt and bitumen imported into the country. In 1921, 92,903 tons of these products were imported; 1922 saw a rise to 146,649 tons; the 1923 figure was 262,871 tons; and during the first nine months of the present year a total of 223,616 tons reached United Kingdom ports. Mexican asphalt and Trinidad natural bitumen make-up the bulk of these imports, while relatively smaller amounts proceed from Italy and the United States. While these natural asphalts have found their principal use in the laying of new roads, they have to some extent displaced coal-tar pitch in certain uses. Further, the use of dehydrated tar in road making is on the increase, but it is not easy to estimate with any exactitude what the quantitative effect of these two factors has really been on the pitch position.

It does appear probable, however, that rock bottom has been reached in pitch prices, and that a slight increase may be expected in the New Year.

STATISTICS OF RATES AND CHARGES.

Average Rates Lower.

The issue for 1924-25 of statistics of rates and charges levied in different towns is the fortieth of the series which, originally compiled by his predecessor, is now published annually by Mr. W. Allison Davies, Borough Treasurer of Preston. From time to time additions have been made to the number of towns included, until the compilation has become a really extensive one; its object being—while it is not intended to demonstrate the desirability or otherwise of municipal trading—to show the actual rates levied in the various places, and the extent to which such rates have been increased or reduced by municipal undertakings and estates. In addition to the rates levied, and the remuneration of profits and losses on municipal undertakings, information is, as usual, given with regard to charges for gas, water, and electricity made for domestic purposes only. Gas undertakings which have adopted the basis of charge provided for by the Gas Regulation Act are indicated; the equivalent charge per 1000 c.ft. being given in the return.

Covering the municipal year 1924-25, the rating statistics are of a very full character. In the first place, there are set forth the figures of population at the time of the census of 1921, and then of the estimated population at Midsummer, 1923. Then follow the area, the rateable value—total and per head of the 1923 estimated population—the amount produced by a penny rate, and the rates per head. Each rate has a column of its own, and the totals are given, and compared with those of the previous year, after adjustments have been made for rate relief or rates in aid. In all this portion of the return occupies thirty-six columns; and the information furnished has reference to 28 metropolitan boroughs, 83 county boroughs, 86 boroughs (one more than last time) and 48 urban district councils (again one more than a year ago). Great as is his own share of the work—*i.e.*, that of collecting the statistics and putting them into order, Mr. Davies points out that without the co-operation of the officers of the localities dealt with the publication of the return would have been impossible.

In each of the four groups into which the return is divided, the average total rates levied exhibits a decrease on the present occasion, which is a matter for congratulation, when consideration is given to the fact that even more substantial decreases in the various averages fell to be recorded a year ago. Taking the 28 metropolitan boroughs first, the average rates levied for 1924-25 amount to 12s. 4¾d. in the pound, which compares with 12s. 9½d. a year ago. The figure for Poplar remains at 23s., while at the other extreme Westminster shows a reduction from 10s. 2d. to 9s. 9d. Stepney, at 14s. 9½d., exhibits an improvement of about 9d.; and the ratepayers of Bermondsey enjoy a much-needed reduction of 2s., from 18s. 6d. to 16s. 6d.

In the case of the 83 county boroughs, the average rates levied on the present occasion figure at 13s. 6½d. in the pound, as against 13s. 11⅞d. for 1923-24. The "two Hams" occupy an unfortunate position in a return which embraces many comforting features; the total rates at West Ham having increased by 1s. 1d. to 24s. 6d., and those at East Ham by a like figure to 23s. 3d. Merthyr Tydfil, though 1s. 2d. better than a year ago, still has the unenviable distinction of being rated at no less than 24s. 4d. in the pound. At the other end of the scale we have Blackpool, with rates totalling 7s. 3d. (an increase of 3d.), Bournemouth 8s. 1d. (a reduction of 4d.), Oxford 8s. 1d. (which is 1¾d. less), Southport 8s. 3d. (a reduction of 1d.), and Darlington and Eastbourne 9s. (the latter being 4d. less than a year ago).

As to the 86 boroughs, here we have total rates levied averaging 12s. 10½d. in the pound, which compares with 13s. 1¾d. in the year preceding. Keighley enjoys a reduction of 6d., but is nevertheless at the top with 18s. 6d., though an increase of 1s. 4d. in the case of Colne brings that borough very close up with 18s. 4d. Then follow Chesterfield with 17s. 8d., Lowestoft 17s. 6d., and Nelson 17s. —all showing reductions, ranging from 4d. to 8d. Most favoured are Tunbridge Wells, with a reduction of 10d., to 8s.; and Bexhill, having a reduction of 1s., to 8s. 6d. Hove, at 8s. 10d., remains the same as a year ago.

The final section, which is devoted to the statistics of 48 urban district councils, shows an average levy of rates of 13s. 5¾d. in the pound; the corresponding figure for 1923-24 having been 14s. 1¾d. Walthamstow, with an increase of 2d., has brought its total up to no less a figure than 24s. 6d. Leyton comes next with 22s., showing a trifling falling-off of 3d. Aberdare has done better with a reduction of 2s., but even now the total rates are at the high level of 21s. Tottenham has achieved a reduction of 1s. 2d., which brings its figure to 17s. 2d. Only three of the urban districts which are included in the list levy rates for the year 1924-25 amounting to less than 10s. in the pound. These are Stretford, 9s. 6d., which is 3d. more than in 1923-24; Coulsdon and Purley, 9s. 8d., as compared with 9s. 11¼d. a year ago; and Whitley and Monkseaton, 9s. 11d., which is a reduction of 7d.

From what has been said, it will be gathered that there are included in the return on the present occasion seven county boroughs and towns, out of 245, in which the rates levied total more than 20s. in the pound. These are: Walthamstow and West Ham, which head the list with 24s. 6d.; Merthyr Tydfil comes next with 24s. 4d.; and then East Ham 23s. 3d., Poplar 23s., Leyton 22s., and Aberdare 21s. This is one less than the eight for the previous year; Middlesbrough having dropped out of the list by reason of a reduction of 4d. in the rates to 19s. 8d. In 1921-22 there were 26 places included in which the rates reached 20s. in the pound or over; but in 1922-23 this figure was reduced to 20.

There are this time 18 places in which the total rates come out at less than 10s. in the pound; the fortunate ones being headed by Blackpool, at 7s. 3d., which is 3d. more than the figure that previously enabled it to share this position of honour with one of the urban districts. The other 17 places are: Tunbridge Wells, 8s.; Bournemouth and Oxford, 8s. 1d.; Southport, 8s. 3d.; Bexhill, 8s. 6d.; Hove, 8s. 10d.; Darlington and Eastbourne, 9s.; Belfast and Stretford, 9s. 6d.; Coulsdon and Purley, Richmond (Surrey), and Kendal, 9s. 8d.; Chelmsford and Westminster, 9s. 9d.; and Lytham St. Annes and Whitley and Monkseaton, 9s. 11d. A year ago there were 17 places where the rates were under 10s. in the pound.

From another section of the return it is noted that the rates levied in the following towns have in the period under review been reduced to the extent of 1s. or more in the pound by transfers from municipal undertakings, &c.; but the figures quoted in the paragraph above are those of rates actually levied, after allowing for any such transfers: Doncaster, Great Yarmouth, and Walsall, 1s. 4½d.; Dewsbury, 1s. 3½d.; Birkenhead, 1s. 1¾d.; Nottingham, 1s. 0¾d.; and Barry, 1s. 0¾d. On the other hand, there appear the names of the following places in which deficiencies on municipal trading undertakings have been incurred to an extent necessitating rates in aid amounting in the aggregate to 1s. or over: Keighley, 3s. 11½d.; Bacup, 2s. 4½d.; Abercarn, 2s. 1d.; Middlesbrough, 1s. 4¾d.; Aberdare, 1s. 4½d.; Llanelly, Merthyr Tydfil, and Preston, 1s. 4d.; Harrogate, 1s. 3¾d.; Heywood, 1s. 3½d.; East Ham, 1s. 2¾d.; and Stalybridge, 1s. 1½d.

There are on the present occasion included in the return eleven cases in which the profits transferred from gas undertakings in relief of rates reached £10,000; this comparing with only six instances in each of the last two returns. The places referred to are: Birmingham, £42,000; Nottingham, £24,324; Bradford, £13,000; Barry, £12,472; Walsall, £11,734; Leicester, £11,592; Belfast, £11,460; Birkenhead, £10,240; and Coventry, Salford, and Wallasey, £10,000. Once again there are but two instances noted of transfers from the rates to municipal gas undertakings in respect of deficiencies; and they are Dewsbury £3000 and Swadlincote £700. A transfer of a like nature on account of electricity undertaking deficiencies occurred at Eston, the sum involved being £1375. The transfers from electricity undertakings in relief of rates amount to £10,000 and upwards in the following cases: Liverpool, £50,000; Birmingham, £31,000; Leeds and Sheffield, £30,000; Stepney, £28,000; St. Pancras, £25,000; Bradford, £23,600; Nottingham, £20,270; Walthamstow, £16,053; Bristol, £16,000; Hammersmith, £15,080; Dewsbury and Hackney, £14,000; Cardiff, £13,556; Brighton, £13,492; Leicester, £12,291; Leyton, £10,028; and Blackpool and Portsmouth, £10,000.

Gas Staff's Christmas Tree.—The staff of the Newcastle and Gateshead Gas Company installed in their showrooms at Grainger Street a Christmas tree, on which the employees placed toys for the children at the Fleming Hospital. Anyone interested was invited to go and see the tree, and take the children, who, if they wished, might place a toy on it for the benefit of the sick children. The tree, with all its gifts, was taken to gladden the hearts of the children at the hospital on Christmas Eve, and the toys on it were distributed by the matron to the little inmates on Christmas Day.

STOCK MARKET REPORT.

THE activity displayed on the Exchange right up to the close of business on Wednesday was remarkable; but in the absence of any political event, either at home or abroad, the gilt-edged market was rather neglected, and prices, if they moved at all, were slightly easier. Home Rails, in spite of the National Wages Board's decision with regard to "mileage" pay, were also steady. It was in the Industrial Market that the business was done. Although it cannot be said that there was a trade boom, there is a cheerful optimism with regard to the future of many industrial and commercial undertakings. If this confidence is justified, it will go a long way towards the settlement of the unemployment problem, as increased production is the only economic solution. The price of Courtaulds is still high, notwithstanding an increasing number of sellers. Other Textiles were also well supported. The Iron, Coal, and Steel markets were fairly steady.

During the few days of business last week Gas Stocks received a fair measure of support, but, as will be seen by the Table, there were only four changes in the quotations. The Liverpool 5 p.c. ordinary rose 3 points, two of the Primitiva debentures 4 points, and the Tottenham "A" 1 point. Prices generally were maintained. Commercial 4 p.c. touched 96, and Oriental 102½.

The following transactions were recorded during the week:

On Monday, Brentford "B" 115½, British 116½, Gas Light and Coke 95, 95⅛, 95¼, 4 p.c. preference 80½, 81, Imperial Continental 177, 177½, 179, Primitiva 9s. 1½d., 4 p.c. (River Plate) debenture 62 *ex* div., South Metropolitan 100¼, 100⅜, 100⅝, 101, 3 p.c. debenture 60¾.

On Tuesday, Bournemouth 4 p.c. debenture 78½, 79½, Croydon sliding-scale 105, European 8 5/16, Gas Light and Coke 95, 95⅛, 95⅜, 95⅝, 95⅞, 96, 4 p.c. preference 80, Imperial Continental 177, South Metropolitan 101. Supplementary prices, Ascot District 10 p.c. (maximum) 8⅜, Colonial Gas Association 70½.

On Wednesday, Brentford "A" 114, British 117⅜, 118, Commercial 4 p.c. 96, Croydon sliding-scale 104½, 105, maximum dividend 86, 87, Gas Light and Coke 95⅛, 95⅜, 96, 4 p.c. preference 80, Imperial Continental 177, Oriental 101½, 102½, Primitiva 8s. 10½d., 9s., 9s. 3d., South Metropolitan 100⅜, Tuscan 29s. 9d. Supplementary prices, Brighton and Hove 4 p.c. debentures 76½, 77, 79.

There were large borrowings from the Bank of England on Wednesday, a very large amount being lent for eight or nine days at 4½ p.c. Day-to-day loans were renewed at 2¾ p.c. and 3 p.c., and the announcement that Treasury Bills had gone at £3 15s. 4.69d. p.c.—about 1d. under last week's average—steadied the market.

The Foreign Exchange market was quiet, business being on a small scale. Sterling on New York closed at 4.69⅞. French francs improved slightly, and closed at 87.27½. Belgians also lost value, and closed at 94.55. Italian lire were worth more at 109.75. Neutral exchanges reflected the dullness in sterling.

There was a further fall in the price of silver, and the cash price was quoted at 32 1/16d. per oz. Gold advanced to 88s. 9d. per oz.

The Bank rate is 4 p.c., to which it was raised from 3 p.c. on July 5, 1923. Bankers' deposit rates are 2 p.c. The deposit rates of the discount houses are 2 p.c. at call and 2¼ p.c. at notice.

Issue.	Share.	When ex-Dividend.	Dividends. Prev. Hf. Yr.	Dividends. Last Hf. Yr.	NAME.	Quotations. Dec. 24.	Rise + or Fall − on Week.	Transactions Lowest and Highest Prices.
£			% p.a.	% p.a.				
171,978	Stk.	Aug. 14	5	5	Aldershot 5 p.c. max. C.	80—83	..	..
235,492	"	"	4	4	Do. 4 p.c. Pref.	72—77	..	..
1,551,868	"	Sept. 25	6	6½	Alliance & Dublin Ord.	63—68	..	..
374,000	"	July 10	4	4	Do. 4 p.c. Deb.	63—68	..	..
300,000	5	Oct. 23	8	8	Bombay, Ltd.	5—5¼	..	..
100,000	10	Aug. 14	8½	8½	Bournemouth 5 p.c.	12½—13¼	..	..
425,050	10	"	7	7	Do. B 7 p.c.	12½—13	..	..
150,000	10	"	6	6	Do. Pref. 6 p.c.	10¾—11⅛	..	..
50,000	Stk.	June 26	3	3	Do. 3 p.c. Deb.	57—60	..	..
162,025	"	"	4	4	Do. 4 p.c. Deb.	77—80	..	78½—79½
992,045	"	July 10	6 1/16	6 1/16	Brentford A Con.	114—119	..	114
990,500	"	"	6 5/8	6½	Do. B New	114—119	..	115½
76,000	"	"	5	5	Do. 5 p.c. Pref.	89—94	..	..
306,690	"	Dec. 18	4	4	Do. 4 p.c. Deb.	75—80*	..	..
181,337	"	"	—	6	Do. 6 p.c. Rich. Red. Deb.	98—103*	..	..
214,740	"	Aug. 28	11½	11½	Brighton & Hove Orig.	170—175	..	..
244,200	"	"	8¼	8¼	Do. A Ord.	125—128	..	..
1,287,500	"	July 24	5	5	Bristol 5 p.c. max.	92¼—93¼a	..	..
853,000	"	Sept. 25	7	8	British Ord.	115—120	..	116½—118
100,000	"	Dec. 18	7	7	Do. 7 p.c. Pref.	123—128*	..	..
120,000	"	"	4	4	Do. 4 p.c. Red. Deb.	72—77*	..	..
100,000	10	Dec. 18	8	6	Cape Town, Ltd.	6¼—7¼*	..	..
100,000	10	Nov. 6	4½	4½	Do. 4½ p.c. Pref.	6—7	..	..
100,000	Stk.	Dec. 18	4½	4½	Do. 4½ p.c. Deb.	71—76*	..	..
626,860	"	July 24	6	6	Cardiff Con. Ord.	97—100	..	..
150,000	"	June 26	7½	7½	Do. 7½ p.c. Red. Deb.	103—106	..	..
237,860	"	Aug. 14	6½	5	Chester 5 p.c. Ord.	86—91b	..	96
157,150	"	July 24	6	6	Commercial 4 p.c. Cap.	94—97	..	..
1,513,280	"	"	6	6	Do. 3½ p.c. Cap.	91—97	..	..
560,000	"	Dec. 18	3	3	Do. 3 p.c. Deb.	57—60*	..	..
475,000	"	14 Jan. 15	—	—	Continental Union, Ltd.	35—40	..	..
800,000	"	Dec. 18	7	7	Do. 7 p.c. Pref.	86—91*	..	..
200,000	"	Aug. 28	6½	6½	Croydon sliding scale	102—105	..	104½—105
660,000	"	"	5	5	Do. max. div.	84—87	..	86—87
284,975	"	Aug. 28	9	6	Derby Con.	107—110c	..	..
492,270	"	July 10	4	4	Do. Deb.	74—76c	..	..
55,000	"	July 24	2	6	European, Ltd.	8—9	..	8 5/8
1,002,180	10	Aug. 14	5⅜	5⅜	Gas Light & Coke 4 p.c. Ord.	94½—96½	..	95—96
16,503,045	Stk.	"	3½	3½	Do. 3½ p.c. max.	61—64	..	..
2,600,000	"	"	4	4	Do. 4 p.c. Con. Pref.	79—81	..	80
4,062,233	"	Dec. 18	3	3	Do. 3 p.c. Con. Deb.	59—62*	..	..
4,761,930	"	—	10	10	Do. 10 p.c. Bonds	..	..	..
130,000	"	—	7½	7½	Do. 7½ p.c. Ilford Deb.	..	..	..
42,000	"	Sept. 11	6½	6½	Hastings & St. L. 5 p.c. Conv.	95—100	..	..
82,500	"	"	5½	5½	Do. 3½ p.c. Conv.	75—80	..	..
258,740	"	Sept. 25	10	10	Hongkong & China, Ltd.	16—17	..	..
70,000	10	Aug. 14	10	10	Hornsey 7 p.c.	138—143	..	..
86,600	Stk.	Nov. 20	30	10	Imperial Continental Cap.	175—180	..	177—179
1,976,000	"	Aug. 14	3½	3½	Do. 3½ p.c. Red. Deb.	70—73	..	..
263,950	"	Aug. 14	6½	6½	Lea Bridge 5 p.c. Ord.	97—102	..	..
235,242	"	Aug. 14	5½	5½	Liverpool 5 p.c. Ord.	94½—94½b	+3	94½
2,127,340	"	Sept. 25	7	9	Do. 7 p.c. Red. Pref.	104—107b	..	..
600,000	"	Aug. 28	8	9	Maidstone 5 p.c. Cap.	125—133	..	..
165,736	"	Dec. 18	3	3 *	Do. 3 p.c. Deb.	54—59*	..	..
63,480	"	Dec. 4	7	5	Malta & Mediterranean	3½—3¾	..	..
73,000	5	Nov. 20	4	4	Montevideo, Ltd.	60—65	..	..
341,920	Stk.	July 24	5½	5	Newcastle & Gateshead Con.	84—84½d	..	..
1,875,892	"	"	4	4	Do. 4 p.c. Pref.	74—75d	..	..
250,166	"	Dec. 18	3½	3½	Do. 3½ p.c. Deb.	68—69*d	..	..
329,705	"	Aug. 28	11	11	North Middlesex 10 p.c.	16—17	..	..
15,000	10	"	7 7/16	7 7/16	Do. 7 p.c.	11¼—11⅝	..	..
75,940	10	"	7 7/16	7 7/16	Oriental, Ltd.	100—105	..	101½—102½
300,000	Stk.	Dec. 4	7	9	Plym'th & Ston'house 5 p.c.	112—117	..	..
138,120	"	June 26	7⅞	7⅞	Portsea Island B	99—102	..	..
60,000	50	Aug. 28	13	13	Do. C	95—100	..	..
100,000	50	"	12	12	Primitiva Ord.	8/0—9/6	..	8/10½—9/3
2,289,909	1	—	—	—	Do. 4 p.c. Red. Deb.	76—79	..	..
311,100	100	Dec. 1	4	4	Do. 4 p.c. Red. Deb. 1911	61—63	..	..
600,000	Stk.	July 24	4	4	Do. B. Aires 4 p.c. Rd. Db.	65—67*	+4	..
220,335	"	Dec. 18	4	4	Do. R'r P'te 4 p.c. Rd. Db.	65—6 *	+4	62
321,670	"	"	4	4	San Paulo 6 p.c. Pref.	7¼—7⅝	..	..
150,000	10	Sept. 25	6	6	Do. 5 p.c. Red. Deb.	44—44	..	..
125,000	50	July 1	5	5	Sheffield A	104—106s	..	..
270,000	Stk.	Aug. 28	5/8/4	5½	Do. B	104—106s	..	..
419,968	"	"	5/8/4	5½	Do. C	104—106s	..	..
1,047,000	"	"	5/8/4	5½	South African	7—9	..	..
90,000	10	Oct. 23	8	6	South Met. Ord.	100—102	..	100½—101
6,609,895	Stk.	Aug. 14	6½	5	Do. Red Pref.	98—100	..	..
102,580	"	July 10	5	5	Do. 3 p.c. Deb.	60—63	..	60½
1,895,443	"	"	3	3	Do. 6½ p.c. Red. Deb.	104—106	..	..
734,000	"	Sept. 11	6½	6½	South Shields Con.	137—139d	..	..
91,500	"	Aug. 28	8½	8½	South Suburban Ord. 5 p.c.	107—112	..	..
1,087,795	"	Aug. 14	6½	6½	Do. 5 p.c. Deb.	94—99*	..	..
368,837	"	Dec. 18	5	5	South'mpt'n Ord. 5 p.c. max.	83—86	..	..
647,740	"	Nov. 6	5	5	Do. 4 p.c. Deb.	72—77*	..	..
121,275	"	Dec. 18	4	4	Swansea 7 p.c. Red. Pref.	102—104	..	..
250,000	"	Aug. 28	7	7	Do. 6½ p.c. Red. Deb.	102—104*	..	..
200,000	"	Dec. 18	6½	6½	Tottenham District A 5 p.c.	119—122	+1	..
120,000	"	July 24	8	8	Do. B 3½ p.c.	102—105	..	..
882,275	"	"	6½	6½	Do. 4 p.c. Deb.	75—79*	..	..
281,255	"	Dec. 18	4	4	Tynemouth Con. and New Uxbridge, Maidenhead, & Wycombe 5 p.c.	84—86d	..	..
238,251	"	Aug. 28	7/14/4	5	Do. 5 p.c. pref.	102—107	..	..
187,294	"	Aug. 28	6½	6½	Do. 5 p.c. Maidenh'd	95—100	..	..
68,330	"	Aug. 28	—	5	Wandsworth, Wimbledon, and Epsom—	100—105	..	..
91,800	"	—	—	—	Wandsworth A 5 p.c.	140—145	..	..
30,000	"	July 10	9½	9½	Do. B 3½ p.c.	120—125	..	..
255,636	"	"	7½	7½	Do. C	102—107	..	..
108,075	"	"	6/7/9	6/9/6	New Ordinary	..	..	..
240,865	"	"	6/7/9	6/9/6	Wimbledon 5 p.c.	116—121	..	..
342,000	"	"	7¼	7¼	Epsom 5 p.c.	122—127	..	..
98,000	"	"	7¼	7¼	5 p.c. Deb.	57—60*	..	..
28,416	"	Dec. 18	3	3				

Quotations at:—*a.*—Bristol, *b.*—Liverpool. *c.*—Nottingham. *d.*—Newcastle. *s.*—Sheffield. * Ex. div.

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NORTH-EAST COAST COAL TRADE.

From our Own Correspondent.

Christmas week has passed in the usual quiet fashion as far as this market is concerned, with new business practically at a standstill. Merchants were concerned principally with getting cargoes shipped and away before the holidays, and there was the usual pressure for coal, already bought, for this purpose.

The undertone for the early part of the year has hardly been so firm, and inquiries continue to show that buyers' ideas on the Continent are still below that of the collieries.

This week will be equally quiet, with the Exchange opening only half days throughout, and no very serious business can be expected until the New Year holiday is out of the way.

Gas coals remained firm, Wear specials quoting 22s. to 22s. 6d., best qualities 21s. 6d., and others about 18s. 6d. or 19s. f.o.b.

YORKSHIRE AND LANCASHIRE COAL TRADE.

From our Local Correspondent.

Gas coal contractors in Yorkshire and Lancashire are now taking better deliveries against contracts, and collieries which were sold ahead are feeling the benefit; but in view of the low prices which ruled during the summer months for forward deliveries, many reserved tonnages for outside sales. Prices dropped very considerably, and even at the present low open market conditions collieries are finding difficulty in disposing of their outputs. This may tend to lower prices for next year's contracts, but it is as yet too early to discuss the matter.

There was this year none of the usual rushes for household coals a few days before the Christmas holidays, and in this respect conditions remain normal.

There was no chance of industries recovering before Dec. 31, and the outlook is still one of anticipation for the early part of 1925, although it must be confessed that there are as yet no actual signs of immediate improvement. The opinion is freely expressed in business circles that it will be some considerable time before there is an upward tendency, and, as a consequence, the early part of next year, in view of possible labour troubles, may be a rather anxious period for the coal trade, especially as the German hold on the nearer Continental markets appears to be both extensive and permanent. In regard to the majority of exported fuels, it is impossible for the English market to compete. It seems as if there will have to be a material alteration in the foreign rates of exchange to enable the Continental buyers to resume their previous business activities in fuel from this side.

Most of the collieries resumed work on Monday, but it was anticipated that the majority would finish early in the day.

COAL TRADE IN THE MIDLANDS.

From our Local Correspondent.

It was only a half-hearted start that was made at the beginning of the week; but with the opening of the New Year the collieries in this area will be getting into their stride again. A little more interest is being taken in preparations for the rush which a hardening of the weather must bring in the house coal trade. The mild conditions which have prevailed during the Xmas season have left collieries and distributors well provided against immediate requirements, however. With the gas industry on its maximum lighting load, and a fair prospect of increasing demands for power and heat, there is some augmentation of traffic between the pits and the gas-works; engineers being anxious to keep stocks up to the highest level. Industrialists enter into negotiations for fresh supplies of fuel under favourable market conditions; but the economic position of the coal trade prevents any material subsidence of prices. Moreover, there are the contingencies of the winter season to reckon with. These are an important factor in current bargaining.

Blast furnacemen are looking with quickened expectancy to the further development of the struggle over coke prices. Plans for bringing more furnaces into operation have lately strengthened the position of the suppliers, who have been fairly successful in adjusting output to the fluctuations of demand. This week, however, all branches of the fuel trade are in too indefinite a state to test values.

TRADE NOTES.

Automatic Lighting.

The Horstmann Gear Company have published a new catalogue describing the full range of Newbridge controllers. The firm have enjoyed a very successful year's business; a large proportion of the sales having been the "UNI" controllers. These possess the advantage of instant detachability of the clockwork portion without interfering with the burners or even shaking the mantles. This greatly facilitates the fitting of spares and general maintenance. There has also been a revival of interest in "midnight reduction" controllers, which light a group of burners at dusk, extinguish a portion at midnight, and the remainder at dawn. Controllers for early morning lights are popular in manufacturing districts. The firm pay special attention to the manufacture of gas cocks. These are machined by a method evolved after much experiment. They are not ground-in, but are so accurately made that no leakage occurs under a pressure of 15 lbs. per sq.in. An ample gas way is provided for all requirements. The new catalogue is of pleasing appearance and makes interesting reading.

CONTRACTS OPEN.

Coal.

The Directors of the Chertsey Gas Company are open to receive tenders for the supply of their requirements of Durham gas coal. [See advert. on p. 911.]

Inclined Retorts.

The Gas Department of the Spenborough Urban District Council are asking for tenders for the rebuilding of one setting of eight inclined retorts at the Heckmondwike Gas-Works. [See advert. on p. 911.]

CURRENT SALES OF GAS PRODUCTS.

The London Market for Tar, Tar Products, and Sulphate.

LONDON, *Dec.* 29.

Business has been quiet during the holiday week, and there is no alteration to report in the prices of products.

Tar Products in the Provinces.

Dec. 29.

We have nothing fresh to report concerning the market for tar products. Doubtless little business will be done now for a few days, but generally the prices of the different products remain steady.

The average values for gas-works products during last week were: Gas-works coal tar, 32s. 6d. to 37s. 6d. Pitch, East Coast, 50s. to 52s. 6d. f.o.b. West Coast—Manchester, 46s. 6d. to 47s. 6d.; Liverpool, 48s. to 49s.; Clyde, 50s. to 51s. Benzole, 90 p.ct., North 1s. 4d. to 1s. 5d.; crude 65 p.ct. at 120° C., 9½d. to 10¼d. naked at makers' works; 50-90 p.ct. naked, North, 1s. 2d. to 1s. 3d. Toluole, naked, North, 1s. 4d. to 1s. 5d., nominal. Coal for crude naphtha in bulk, North, 7½d. to 8d. Solvent naphtha, naked, North, 1s. 4d. to 1s. 6d. Heavy naphtha, North, 1s. 1d. to 1s. 2d. Creosote, in bulk, North, liquid, 5⅝d. to 5¾d.; salty, 5¼d. to 5⅜d.; Scotland, 5⅛d. to 5¾d. Heavy oils, in bulk, North, 6¾d. to 7d. Carbolic acid, 60 p.ct., 1s. 7d. to 1s. 8d. prompt. Naphthalene, £13 to £15; salts, £4 to £7, bags included. Anthracene, "A" quality, 3½d. per minimum 40 p.ct., purely nominal; "B" unsaleable.

Blyth Gas Company.—The Development Committee of the Blyth Corporation have asked Mr. J. Leigh Turner, the Town Clerk, to prepare and submit to the next meeting a report upon the question of the purchase of the undertaking of the Blyth Gas Company.

Bilston Gas Light and Coke Company.—The accounts of the Company for the year ended Sept. 30 disclose a credit balance on profit and loss account, after payment of interim dividends, of £16,377. It is proposed to pay final dividends of 5s. 6d. per share on the "A" shares, and 4s. on the "B" shares, both less tax (making 11s. and 8s. per share respectively for the year), and to carry forward a balance of £14,296. Similar dividends were distributed last year.

Birmingham Gas Rescue Tender.—The Birmingham Fire Brigade have purchased a new rescue tender for use in such emergencies as the breakdown of the ammonia plant at an ice factory or serious gas escapes. The equipment includes eight sets of proto-breathing apparatus, each sufficient to provide artificial respiration for one-and-a-half hours, and eight spare oxygen cylinders, which will add a further similar period to each apparatus. There is also an oxygen reviving apparatus.

Christmas Day at Portsmouth.—The output of gas from the works of the Portsea Island Gas Light Company on Christmas Day reached the figure of 9¼ million c.ft.—a record in the history of the undertaking. No less than 3 million c.ft. was consumed between 11 a.m. and 2 p.m. This figure is also a record one, and suggests that most of Portsmouth's Christmas dinners were cooked by means of gas. This result was attained without a single complaint of deficient pressure at any point in the area of supply. Had no gas been made on Dec. 25, stocks would have been completely exhausted by 4 o'clock.

Morecambe Gas Order.—At a recent meeting of the Morecambe Gas Committee, in regard to the Corporation Gas Special Order the Town Clerk reported that while in London he had interviewed the Parliamentary Draftsman at the Board of Trade, who had given alterations and amendments as suggested by the Board, and promised early submission of the same to Parliament. It was resolved that in connection with the amendments of the Order as suggested by the Board of Trade, the Council be recommended to make application to the Ministry of Health for sanction to the borrowing of the sum of £42,000 for the new works required for the gas undertaking.

Low-Temperature Carbonization, Ltd.—The annual meeting of shareholders is being held to-day (Dec. 31), but the Directors state that they are now concluding negotiations with a strong financial group with the object of providing the necessary capital to carry-out developments on a large scale in the counties of York, Nottingham, Stafford, and elsewhere, and it is hoped to be able to launch two or more of these schemes early in 1925. They were of opinion that to go into details at to-day's meeting might be prejudicial to the Company's interests, and so decided to ask the shareholders to consent to an adjournment of the meeting to a later date, when the accounts made up to Dec. 31, 1924, will be presented and the schemes explained in detail.

A pleasing function took place at Blenheim Works, Hammersmith, on Christmas Eve, when Mr. William Edgar, the founder of the gas engineering firm bearing his name, presented a number of the old employees with turkeys and joints of beef. The recipients numbered 21, with an aggregate of service of 340 years; the oldest servant having been in Mr. Edgar's employment continuously for 30 years.

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Tenders, endorsed "Inclined Retorts," and addressed to the undersigned, should be Delivered not later than 9.0 a.m. on Friday, Jan. 9, 1925.
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CEARA GAS COMPANY, LIMITED.

NOTICE is Hereby Given, that the ORDINARY ANNUAL GENERAL MEETING of the Shareholders will be held at the Office of the Company, No. 9, Queen Street Place, in the City of London, on Wednesday, the 31st day of December, 1924, at One o'clock in the afternoon, to receive the Report of the Directors; to elect a Director and an Auditor; and for General Purposes.
By order of the Board,
E. PRATT,
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Dec. 23, 1924.

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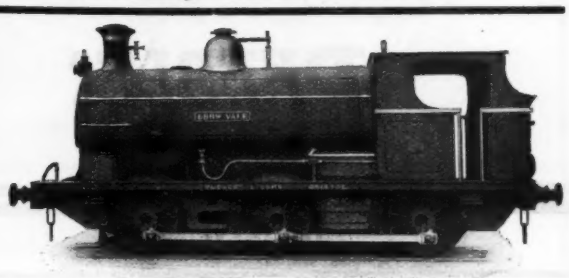

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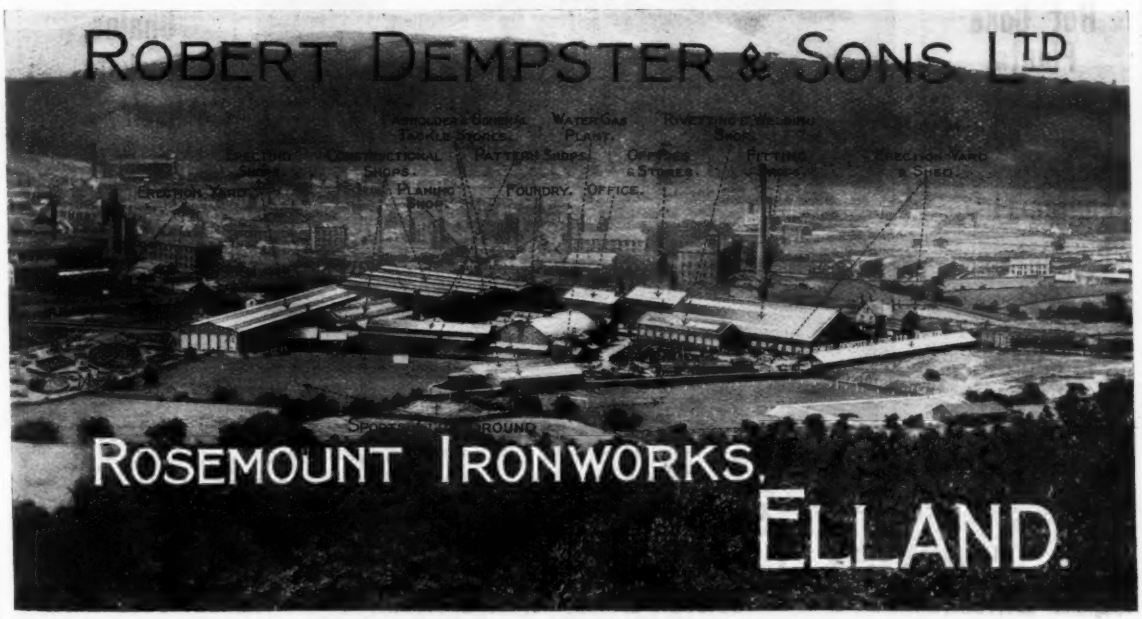

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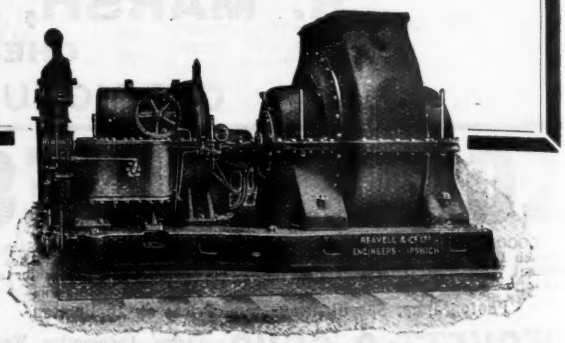

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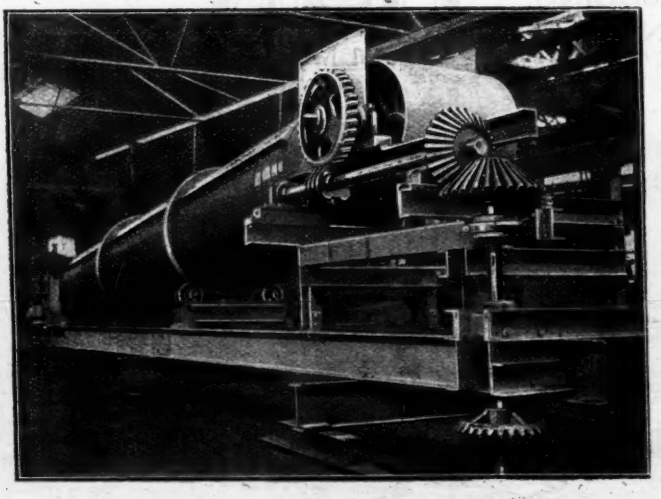

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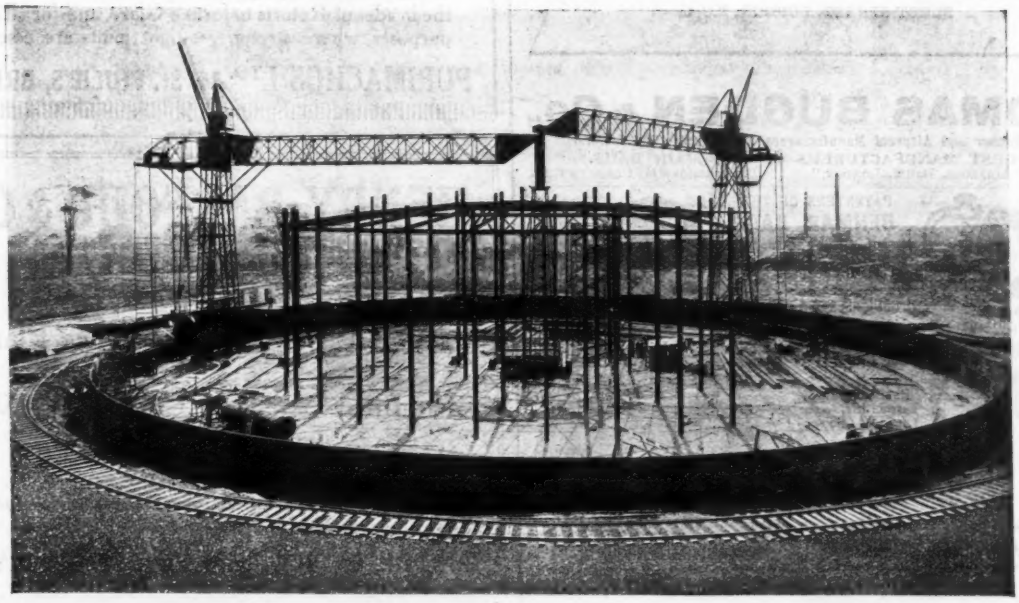

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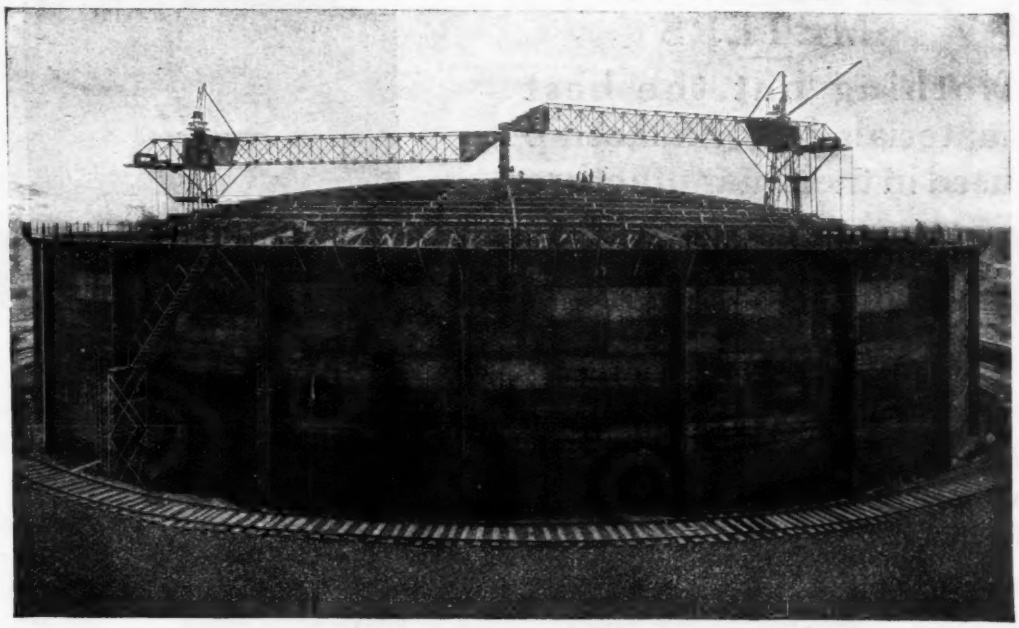

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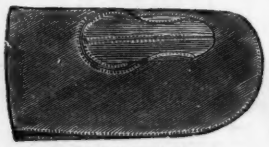

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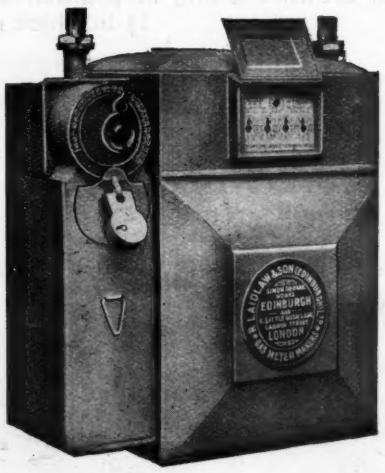

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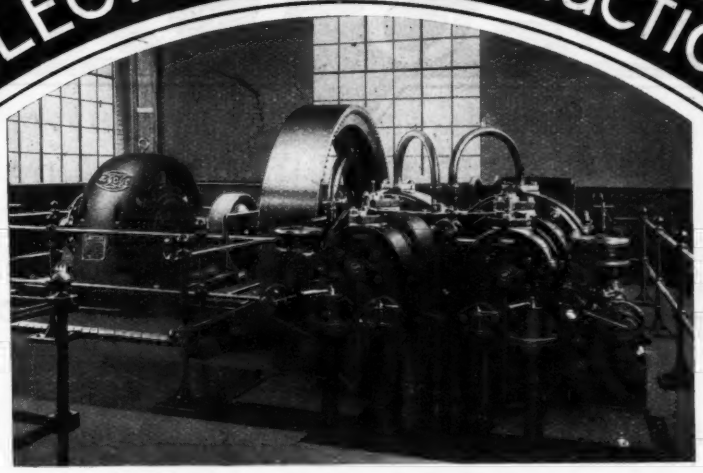

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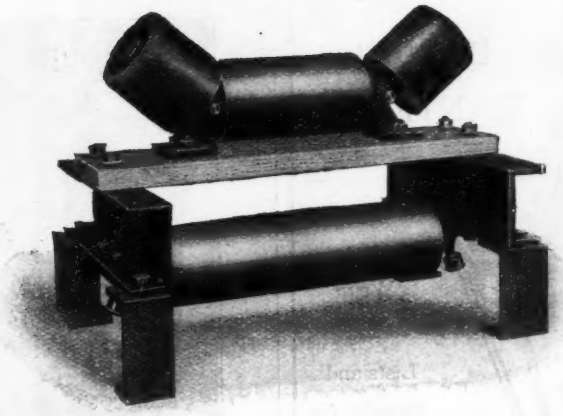

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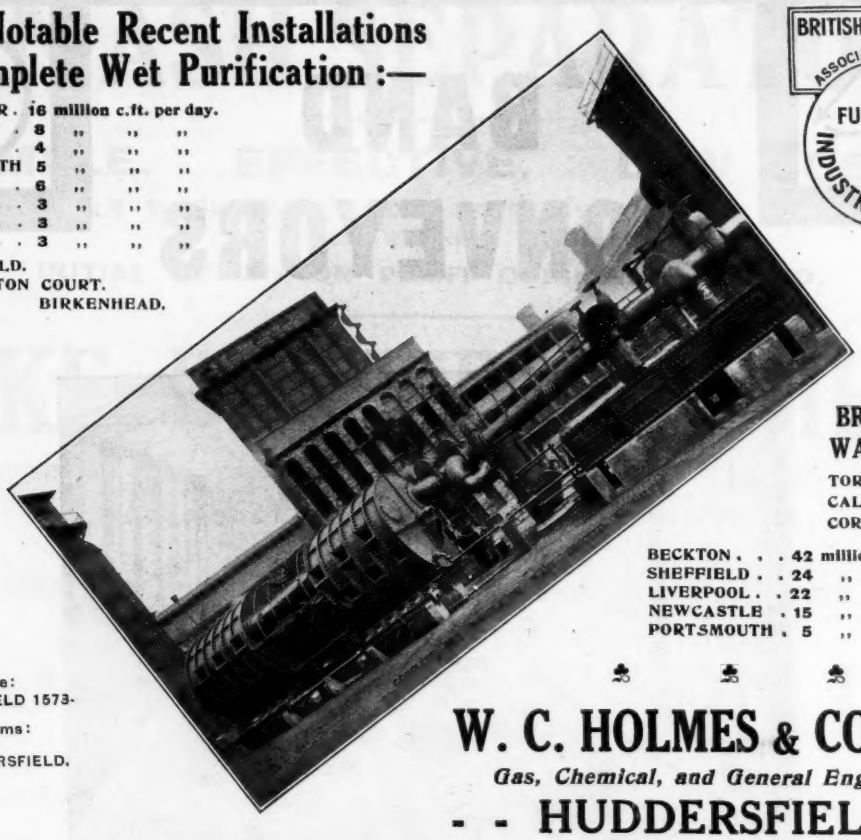

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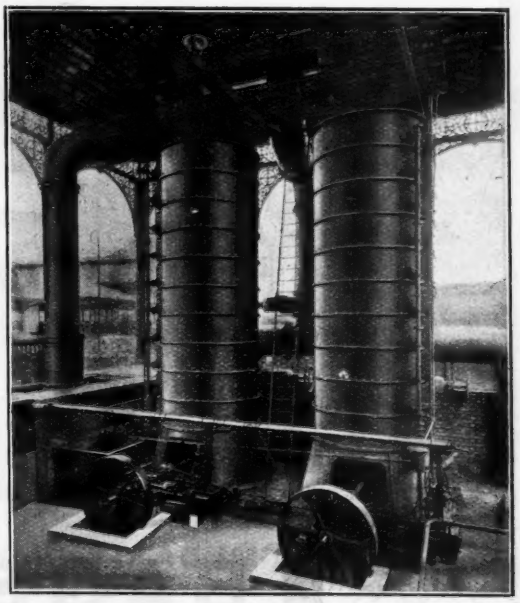

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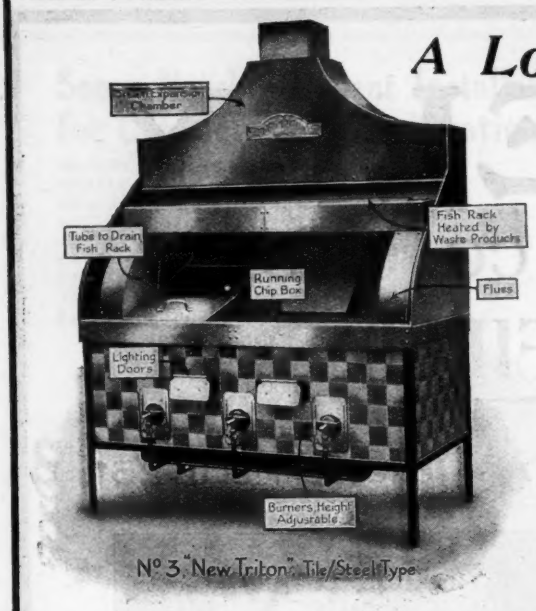

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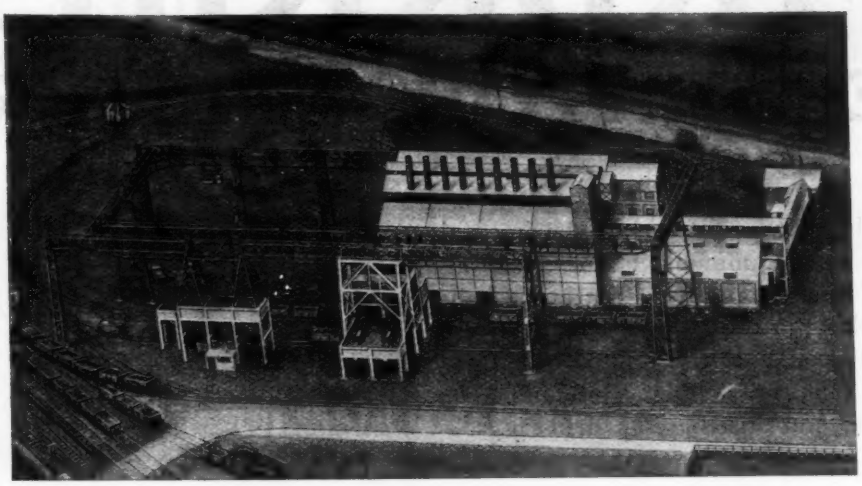

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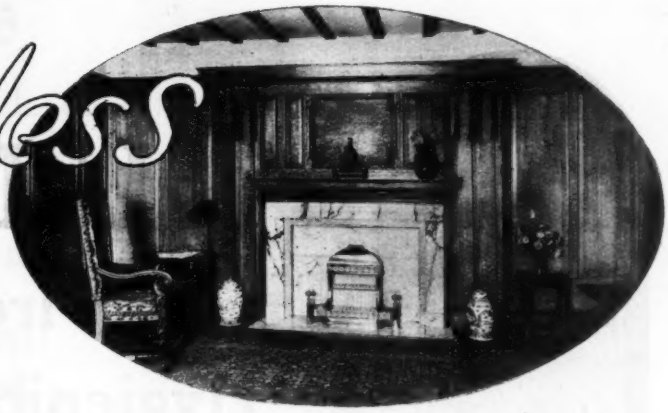

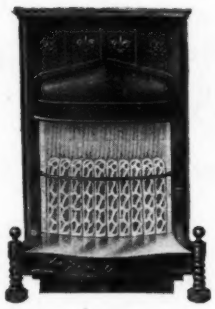

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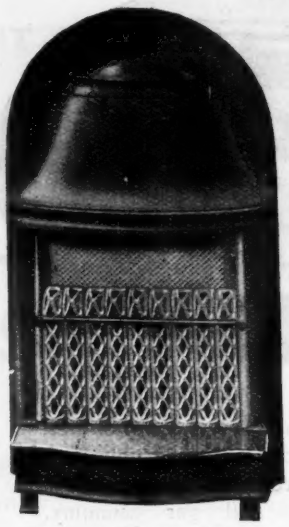

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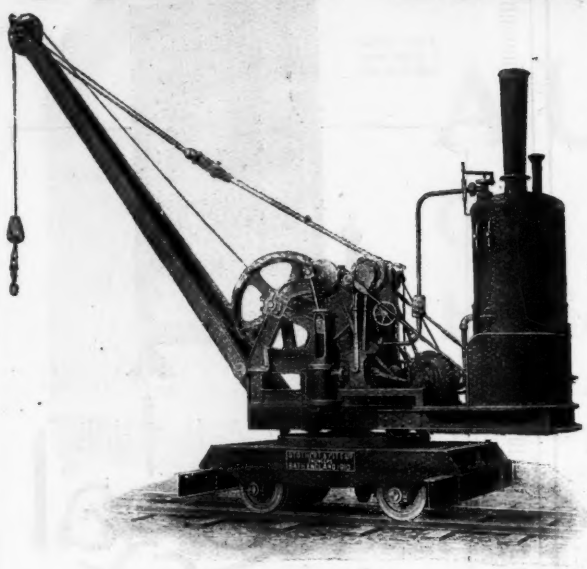

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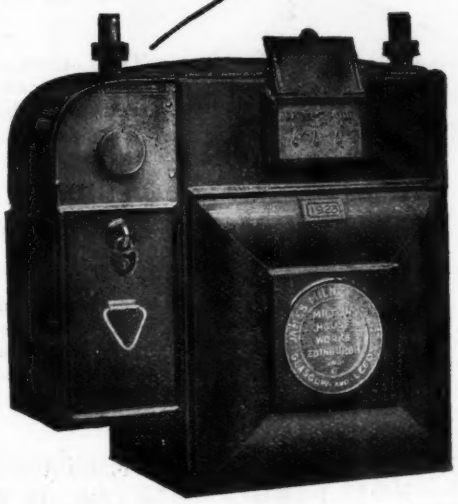

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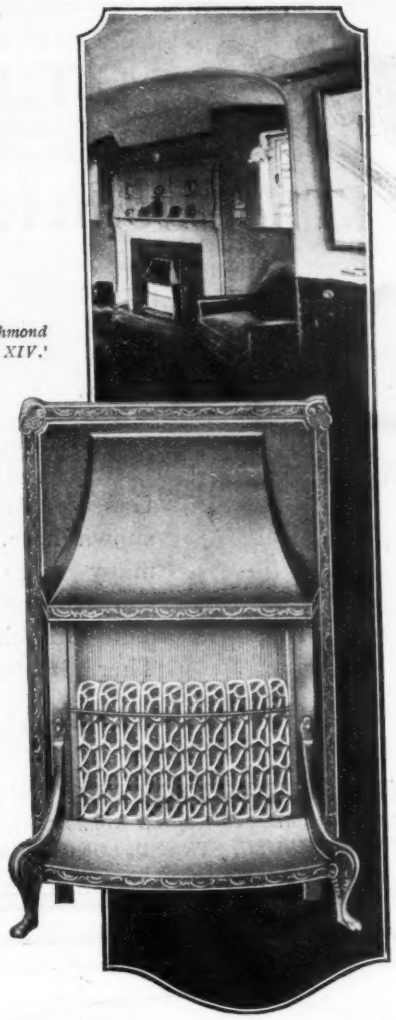

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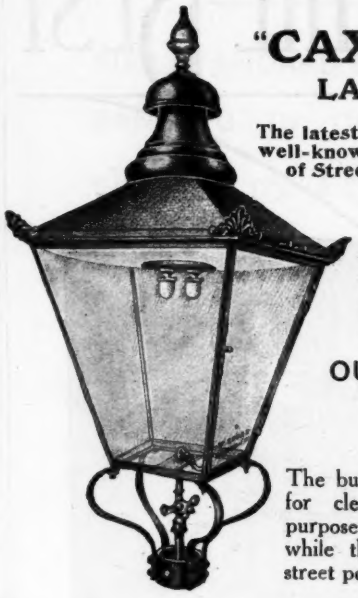

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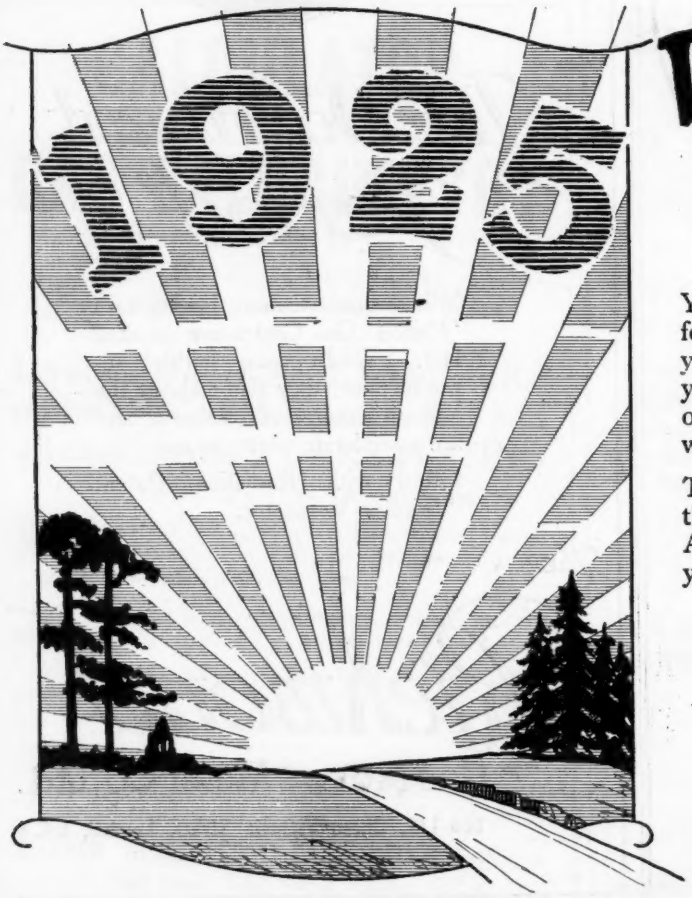

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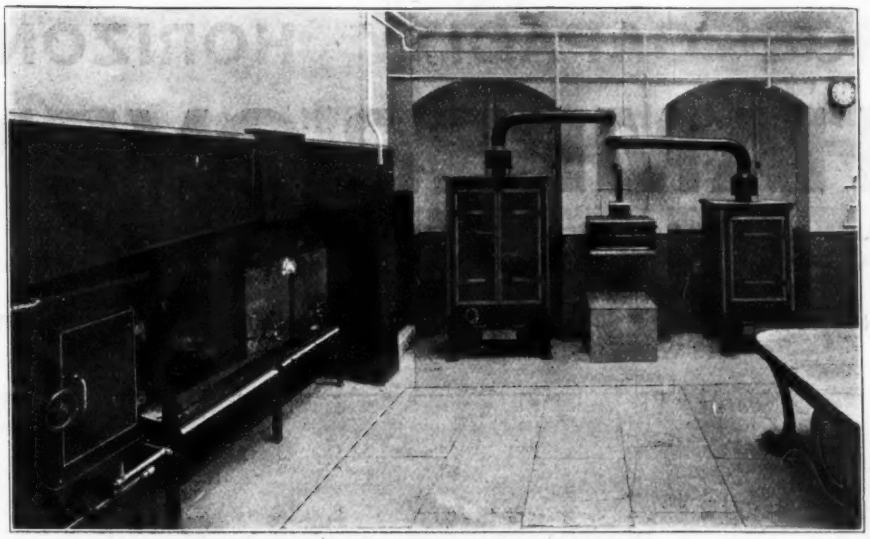

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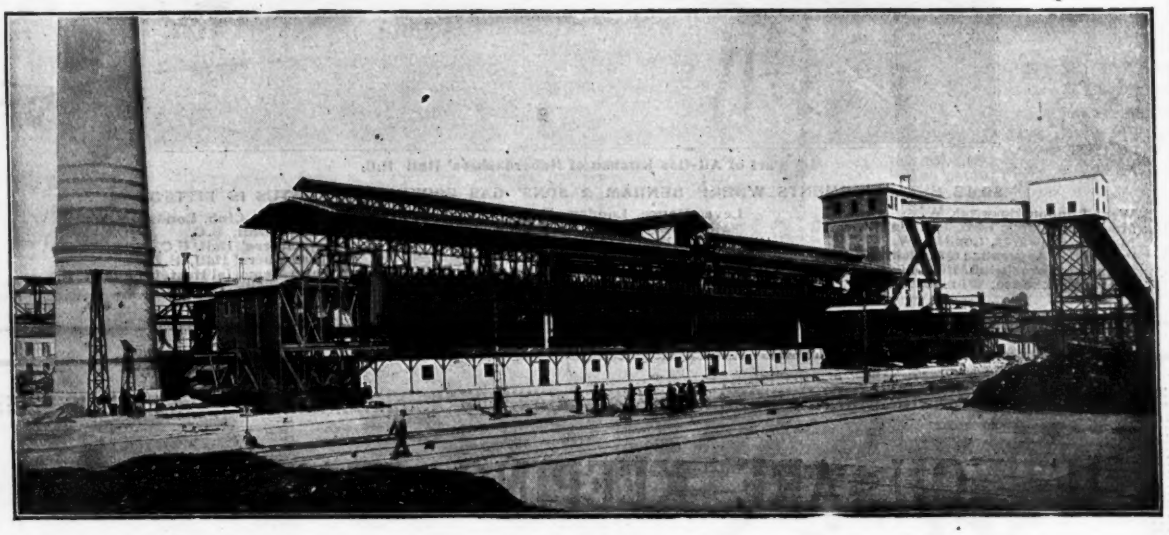

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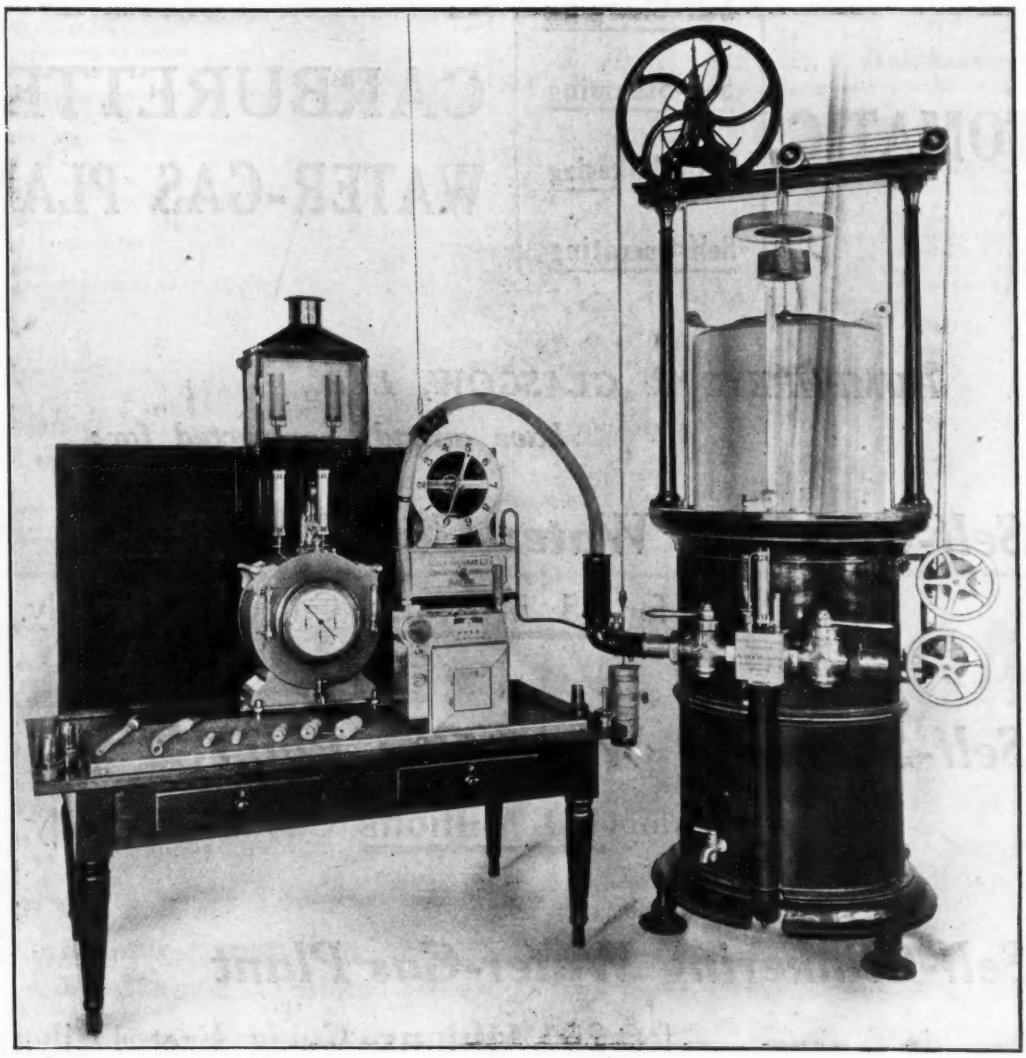

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COIN IN THE SIDE
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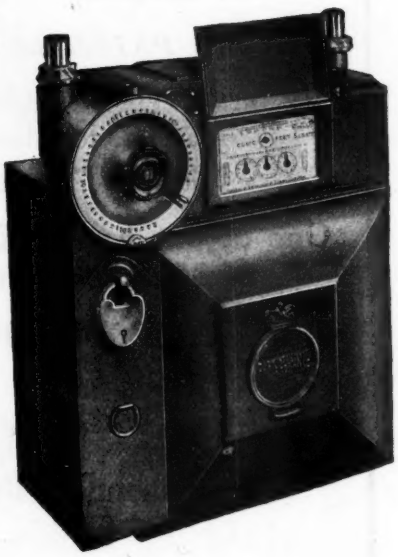
High-class workmanship.



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¶ The WOODALL-DUCKHAM CO. are the PIONEERS of the SINGLE BOILER UNIT for each Retort Bench.

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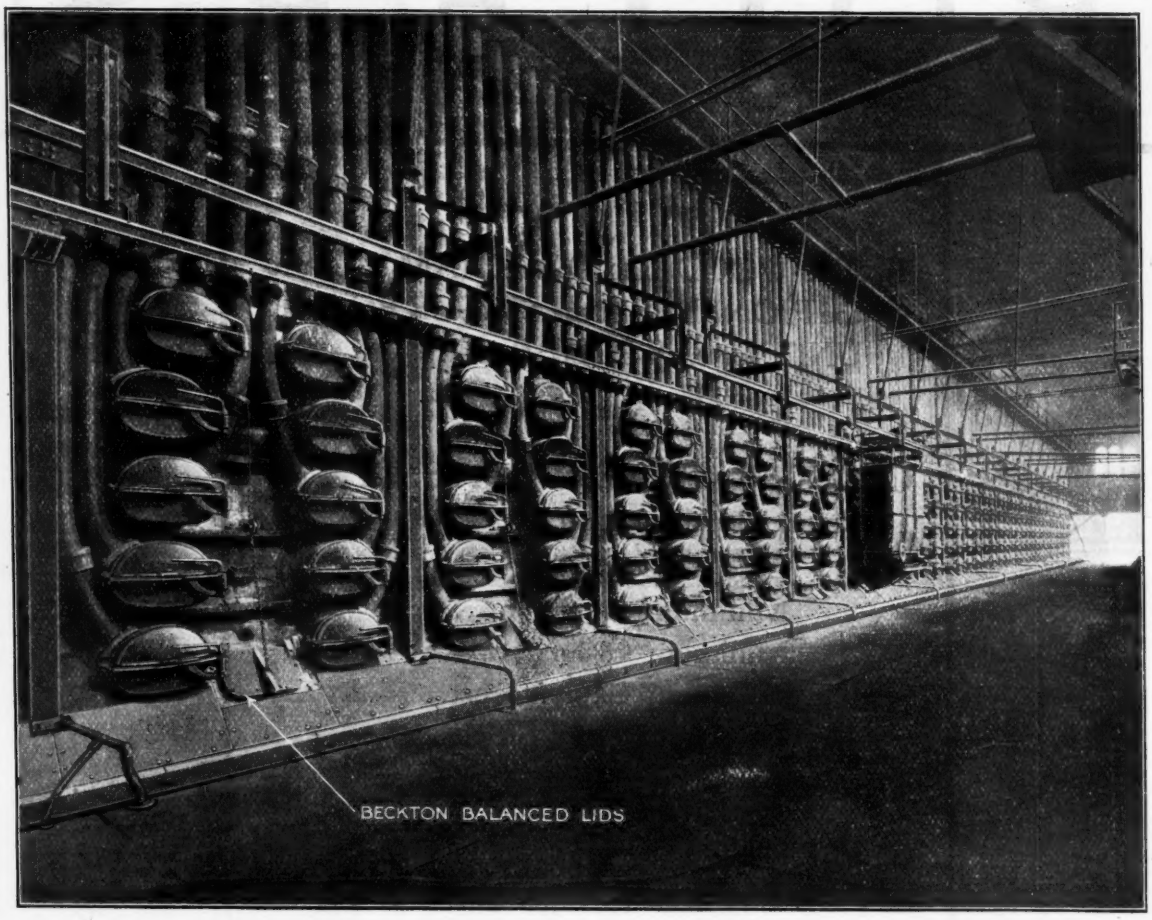
20 BECKTON BEDS OF 10's



". . . . . the flickering fire
Within their lidless eyes, from glowing red
Resurgent leaps to white flame overhead."
—OLGA MILNE WATSON.

WITH

95% ALL-SILICA SETTINGS

BUILT BY

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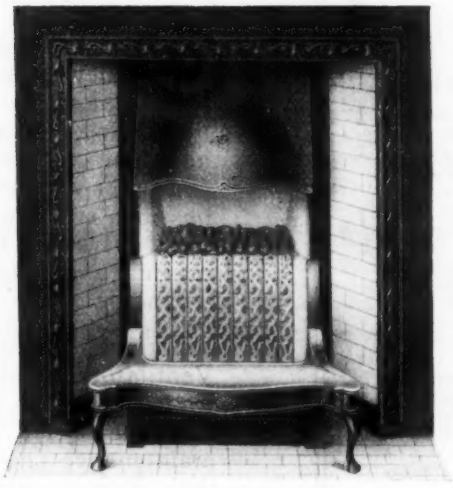
1925



The "Cosie" Gas-Fire.

THAT the coming year may be a Happy and Prosperous Year is the Hearty Wish of the PARKINSON STOVE CO., LTD. This seasonable expression of Goodwill is cordially extended to their many Friends in the Gas Industry.

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Radiation Gas Grate PARTS are *Standardized & Interchangeable*

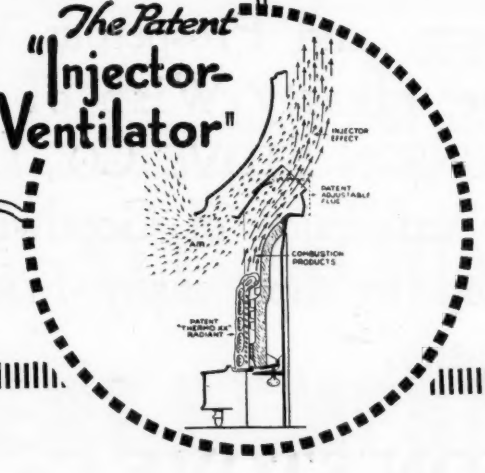
RADIATION

Gas Grates have two openings under the canopy leading to the flue. The lower or "Injector" opening carries away the entire combustion products, and the upper or "Ventilating" opening carries away a large volume of air drawn from the room. The ascending current through the lower outlet promotes the ventilating function in the outlet above; the result is that while pure radiant heat is distributed throughout the room the air of the room is changed a sufficient number of times to ensure an agreeable and healthy atmosphere being maintained. . . .

ONE set of parts will cover the whole of the renewals that may be necessary to any particular size of Radiation Gas Grate, throughout its very wide range of different designs. Thus the adoption of these Grates, besides providing the consumer with the most extended choice of styles possible, suitable for every kind of interior decoration, offers the Gas Undertaking the means of making a big and sustained reduction in maintenance costs.

Additional to the well-known patent "Injector-Ventilator," Radiation Gas Grates have, in the "Thermo XX" Radiants, a further advantage, and one which counts heavily for economy in maintenance charges. These radiants, owing to their design, entirely obviate the use of a loose top piece, and at the same time are unequalled for economy and efficiency.

The Patent **"Injector-Ventilator"**



INJUNCTION.

In a recent action before Mr. Justice Tomlin, an Injunction was granted to restrain fraudulent or obvious imitations of the registered designs which had been copied.

This Injunction covers the adjustable flue, the fire-brick back, the "Thermo XX" radiant, and the Gas-Grate Burner, which have made the enormous success, and general adoption, of the Gas-Grates sold under the control of Radiation Ltd.

APOLOGY.

Two other firms, whose designs infringed on the "Thermo XX" radiants, have since apologised, and undertaken immediately to cease manufacture and sale of them.

Features Exclusive to

Radiation Gas Grates

1 **Canopy correctly shaped** and proportioned. Renders the grate, when properly fixed, thoroughly hygienic. Embodies the patented "Injector-Ventilator," ventilating the whole apartment as efficiently as a coal fire.

2 **Patent adjustable flue nozzle,** which facilitates the fitting in front of an existing coal grate having a low canopy. Has a traverse of 90 degrees – i.e., from a vertical to a horizontal position, and can be set to any required angle between these extremes.

3 **The "Thermo-XX" fire front** on exhaustive tests is found to give the highest percentage of pure radiant heat. Upright radiants only are required; the separate horizontal top section being dispensed with.

4 **Burner is silent in action** and economical in gas consumption.

5 **Patent gas injector,** adjustable to obtain best results under all conditions of pressure and quality. Provision is made for the Gas connection on either side of the Grate, a reversible brass plug being supplied for closing the unused inlet. All the gas fittings are concealed within the Grate.

6 **The burner** is made in two types, **Simplex and Duplex.** In the latter case, the gas is controlled by a single three-position tap, which permits of the end jets on either side being extinguished, if desired, leaving the centre only burning.

Radiation Gas Grates are Manufactured & Supplied by

ARDEN HILL & CO., Acme Works, Aston, Birmingham, and London.

THE DAVIS GAS STOVE CO., Ltd., 60, Oxford Street, London, W.1, and Luton.

FLETCHER, RUSSELL & CO., Ltd., Palatine Works, Warrington, and London.

THE RICHMOND GAS STOVE & METER CO., Ltd., 164-172, Queen Victoria Street, London, E.C. 4, and Warrington.

WILSONS & MATHIESONS, Ltd., Carlton Works, Armley, Leeds, and London.

JOHN WRIGHT & CO., Essex Works, Aston, Birmingham, and London.

Radiation LIMITED

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THERE are many remarkable instances of our Refractories, in Fireclay and in Silica, standing up to constant service for great periods. The two quite untouched photos below are typical examples.

Some large Horizontal Carbonizing Plants erected by Drakes during the last few years :—

Furnaces and Settings of 10 at :

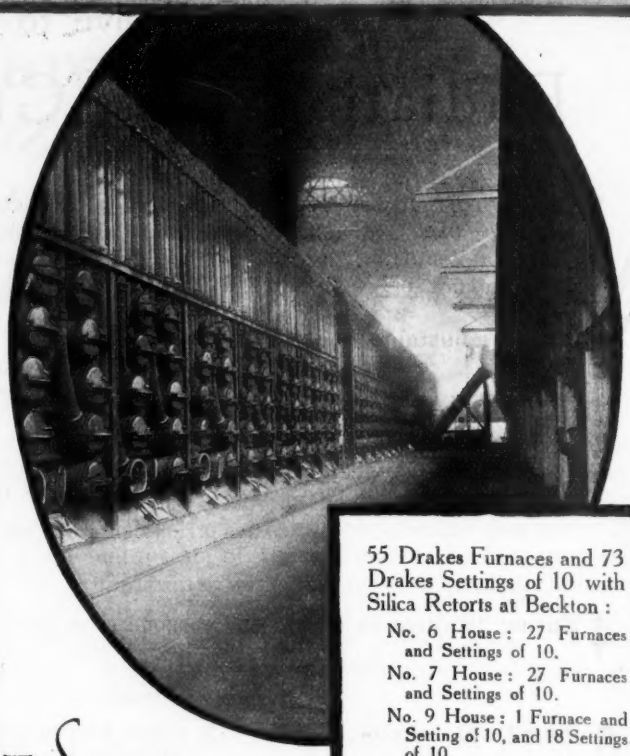
South Shields - - -	10 Beds.
Keighley - - - - -	11 ,,
Swansea - - - - -	14 ,,
Croydon - - - - -	14 ,,
Huddersfield - - - -	18 ,,
Brighton - - - - -	20 ,,
Manchester, Bradford Rd.	26 ,,
London, Beckton - -	55 ,,

Wigan, South Shields (Jarrow Works), etc., etc.

Furnaces and Settings of 8 at :

Lytham, Widnes, Padiham, Warwick, Brentwood, etc., etc.

These Retorts vary from 23 ft. to 15 ft. long. The large majority being 24 in. by 18 in. by 23 ft.



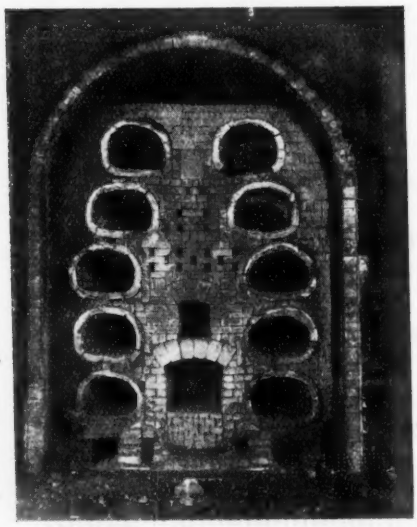
55 Drakes Furnaces and 73 Drakes Settings of 10 with Silica Retorts at Beckton :

No. 6 House : 27 Furnaces and Settings of 10.

No. 7 House : 27 Furnaces and Settings of 10.

No. 9 House : 1 Furnace and Setting of 10, and 18 Settings of 10.

Service and Thoroughness



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No. 5 Setting when let down after working 2660 days under maximum temperature.

Manchester—
Put to work in 1917 and let down July, 1923, to effect repair to 3 mouthpiece ends damaged by accident.

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GAS REGULATION ACT, 1920.

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CALORIMETERS

PRESCRIBED BY

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ARE

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:: PRINCIPALLY ::

BY

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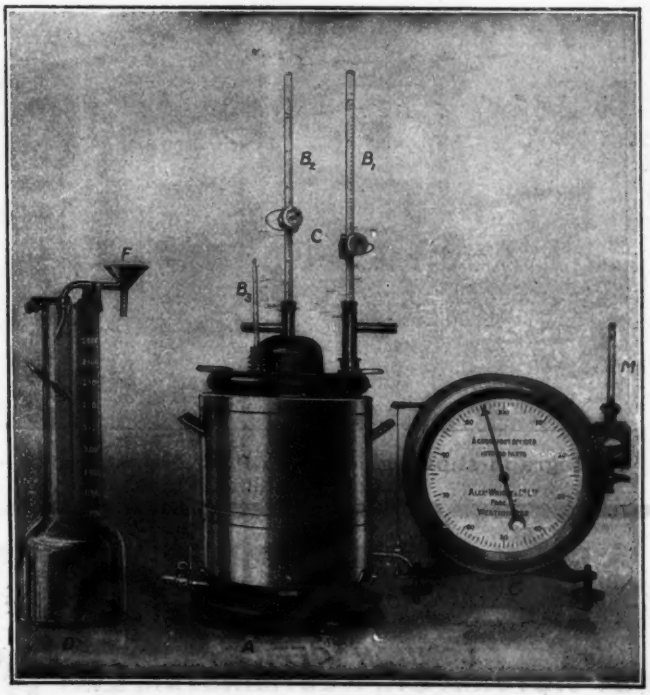
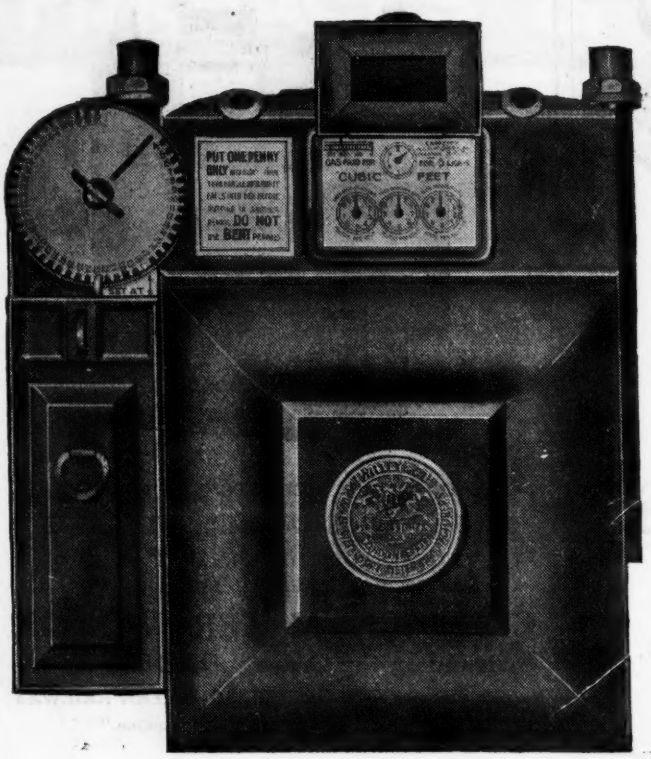
1, WESTMINSTER PALACE GARDENS,
WESTMINSTER, S.W. 1.



PERFECTION.



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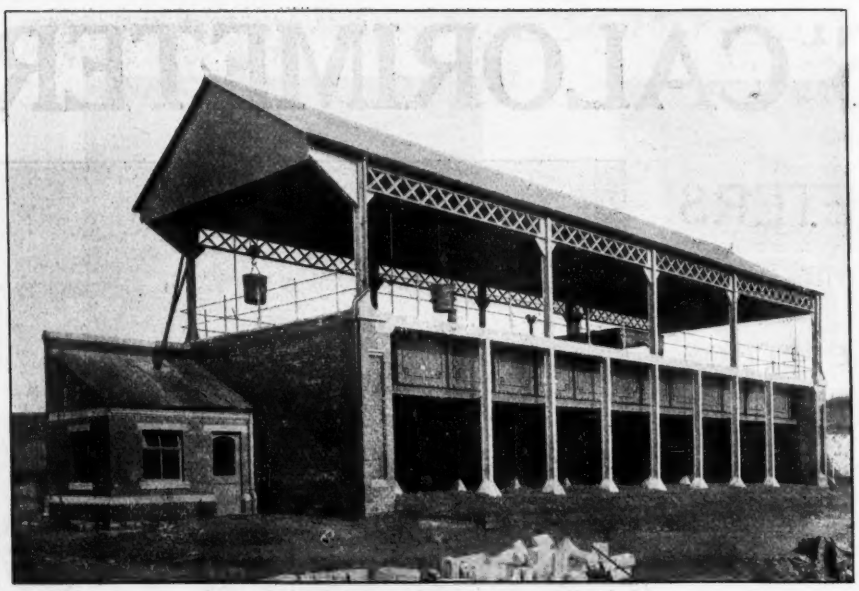

Photograph showing complete Purifier Installation with Hovey Crane, Oxide Handling Plant, Roof, &c.

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'Reversing Valves'

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Fig. 702. "SINGLE RAM" STEAM-PUMP.

Fig. 686. "CORNISH" STEAM-PUMP FOR BOILER FEEDING, &c.

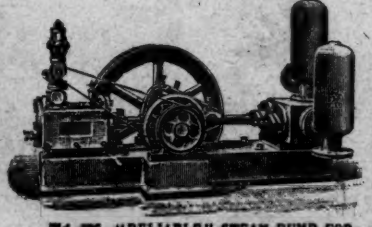

Fig. 695. "RELIABLE" STEAM PUMP FOR TAR AND THICK FLUIDS.

Fig. 712. "DOUBLE-RAM" STEAM-PUMP.

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